Southwestern Medicine

OFFICIAL ORGAN OF

ARIZONA STATE MEDICAL ASSOCIATION — NEW MEXICO MEDICAL SOCIETY

EL PASO COUNTY (TEXAS) MEDICAL SOCIETY

THE MEDICAL AND SURGICAL ASSOCIATION OF THE SOUTHWEST

VOL. XIX. OCTOBER, 1935 No. 10

ANNUAL SUBSCRIPTION $2 SINGLE COPIES 25 CENTS

Entered at the Postoffice at Phoenix, Arizona, as second class matter.

"Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized March 1, 1921."

PHYSIOLOGY OF BONE IN RELATION TO TRAUMATIC INJURIES

W. WARNER WATKINS, M. D.

Pathological Laboratory, Phoenix, Ariz.

"Progress in medicine is rapid. Each year are presented innumerable new ideas. Add a fact or two, change the viewpoint and there is born a new truth. The well-informed man of today is in a few years hopelessly behind, unless he keeps constantly in step with progress."

This quotation from an address by Dr. Richard Smith, Regent of the Medical School of the University of Michigan, well expresses the urge which led to this preliminary paper on bone physiology. That industrial medicine has become a highly specialized art requiring the type of practitioner who "keeps constantly in step with progress" is well illustrated by legislative developments in the state of New York. By a recent law the state medical society recommends five physicians to be appointed on the labor council by the governor. These men have the responsibility of designating doctors in the different county societies who are qualified for various phases of compensation practice. This is a significant recognition of the fact that there are many doctors, legally qualified to be members of county societies but who are not considered competent to handle industrial injuries.

Occupying the center of interest in most industrial injuries is the question of damage suffered by bones, the organs of support and locomotion, and in the management of traumatic injury, even a simple fracture, it is important to have thorough understanding of the fundamental structure and function of bone tissues. From the days when we burned the midnight oil, as medical students, over bleached and polished skeletons, we have retained the impression that bone is a simple structure with stable function, that after maturing it remains practically unchanged unless altered by injury or disease, and even then it has a persistent tendency to return to its former condition. If we still hold this idea we have not "kept step with progress," because physiologic research has shown that bone is a complex tissue, combining cellular activity and diverse biochemical processes, and is subject to marked and rapid changes from slight causes. In comparison with nerve tissue, which has a marked anatomical and functional inflexibility, there must be continual cooperation among several systemic and local factors in order to maintain the structural integrity of the skeleton or to accomplish simple bone repair. We can understand this better if we realize that in genetic evolution bone is **primarily** a storehouse for calcium and phosphorus, entirely comparable to the liver as a storehouse for carbohydrate. The utilization of the bony calcium depots for support and locomotion, as these functions developed, are **secondary** characteristics of the evolutionary process. In the biologic economy of the organism, the cellular demands for calcium and phosphorus are met by the normal supply of these inorganic salts in the blood stream; when this supply falls below the vital requirements, the demands are met by the rapid removal of calcium and phosphorus from bones, regardless of unfavorable results of such removal on support and locomotion. Obviously, then, in dealing with bone injuries, if we wish to insure bone repair by the deposit of calcium in the form of callus, we must first make certain that the general metabolic requirements for calcium are met, else biologic nature will be found reluctant to yield up its blood calcium to repair a local injury. In preserving the normal calcium metabolism several factors combine, such as sufficient intake of calcium and vitamin D, sunlight, hormones of several endocrine glands especially the thyroid and parathyroid, reaction of blood plasma, and so forth.

There has been interminable discussion as to whether bone growth in the developing organism and bone regeneration in repairing a local injury are governed by the same controlling factors and follow the same mechanism. The preponderance of evidence is in favor of their being so similar that, for all practical purposes, they can be regarded as the same. There are two schools of teaching with regard to bone formation: (1) The cellular or vital, which teaches that bone is formed by the secretory activity of living cells, the osteoblasts, which make bone just as epithelial cells make mucus or other special secretions; (2) the humoral or physico-chemical, which teaches that bone is laid down as the result of chemical conditions in the body fluids, the osteoblasts having the function of preparing the field for the deposit of calcium. This paper will not discuss these two theories, partly from lack of time but chiefly because, in the final analysis, the differences are academic and of no practical bearing on the problems which the surgeon meets. There are important facts on which there is general agreement.

Bone is modified connective tissue. That is a trite statement with profound significance, because it means that wherever and whenever bone is formed, it must arise from pre-existing connective tissue of a more primitive type. The process must always start with undifferentiated mesoblastic cells and pass through the same series of changes, whether the process is in the ossification centers of growing bones, or in the repair of a fracture by conversion of callus into bone tissue. (1) Recalling our first lessons in embryology, all forms of connective tissue arise from the mesodermic cells which are all alike in the beginning and differentiate into various types of connective tissue, such as areolar, reticular, lipoid, fibrous, cartilage and osseous. This mesodermic tissue, before differentiation occurs, is called embryonic tissue, which is the necessary antecedent of any sort of connective tissue at any age. If we hold fast to this principle, our understanding of bone physiology and bone repair will be simplified. Without antecedent embryonic connective tissue there can be no new bone. (2) In the growing or mature individual, this embryonic tissue quickly appears after injury, known as granulation or organization tissue. Given suitable conditions, this undifferentiated granulation tissue is capable of being transformed into any type of connective tissue, such as fibrous, fatty, cartilage and bone. Not only must there be antecedent embryonic or granulation tissue in order for bone to form, but there must also be suitable systemic and local stimuli which will lead to the differentiation of this tissue through several stages, culminating in the deposition of calcium and the conversion of the calcium deposit into bone tissue.

Bone formation then occurs only with the concurrence and concatenation of several factors, some systemic and others local.

The SYSTEMIC FACTORS are: Calcium and phosphorus content of the blood, intake of calcium and phosphorus, parathyroid hormone, vitamin D, reaction of foods and intestinal contents, and hydrogen ion concentration of plasma.

In health the calcium and phosphorus content of the blood is maintained at a constant level, and bone will not be formed at the expense of blood calcium. We repeat that the primary metabolic demand for calcium and phosphorus is not for bone formation but for vital processes and only the excess calcium is stored in bones which are thus somewhat fortuitously made suitable for their secondary functions of support and locomotion.

The intake of calcium and phosphorus in the form of food must be sufficient to meet the metabolic demands of the whole organism; lacking this the calcium will be removed from the skeletal storehouse and utilized in the general body economy. Such metabolic demands may even call for the calcium already deposited in a callus; for it has been experimentally shown that the callus about a fracture can be made to disappear by feeding a diet deficient in calcium.

The mobilization of calcium is controlled by the internal secretion of the parathyroid gland. Under the influence of parathormone calcium is removed from bones and thrown into the blood stream. Hyperparathyroidism, therefore, brings about a local or generalized halisteresis, which may be followed by the redeposit of calcium in areas where local factors are favorable for such deposit, or by the excretion of the surplus blood calcium through the kidneys.

Vitamin D is necessary for the normal distribution and deposit of calcium. This vitamin is usually supplied in a properly balanced diet, but if this is not the case it can be given artificially.

The reaction of foods and of the intestinal contents must be favorable in order to promote the absorption of the ingested calcium into the blood. It is obviously useless to provide calcium by mouth when the intestinal conditions are such that it will be precipitated as insoluble salts or combined in such forms that its absorption into the blood stream will not occur.

The hydrogen ion concentration of the blood plasma must be favorable, since calcium and phosphorus compounds are sensitive to slight changes in reaction. A striking example of this is the profound demineralization, of the skeleton which occurs in renal rickets, of chronic vascular nephritis due to upset of the pH of the blood through accumulation of phosphorus which the damaged kidneys cannot eliminate.

The LOCAL FACTORS are: Circulatory, neurotrophic, local surcharge of calcium, enzymic action of phosphatase, cellular activities, and mechanical stresses.

The calcium, phosphorus, hormones, vitamins and other substances dissolved in the blood serum and plasma must be brought by the circulation into intimate contact with areas where bone formation is to occur. This means that the integrity of the circulation or the vascularity of the part is the sina qua non of any bone growth or repair. In the treatment of a fracture it is much more essential to preserve the blood supply to the area of injury than it is to secure anatomical alignment of fragments, because if the blood supply is interrupted, healing cannot take place, no matter how nicely the fragments are adjusted. Many surgeons have very hazy ideas about the sources of blood supply to a given area, and their forcible repeated and prolonged manipulations must inevitably tear the delicate periosteal blood vessels or even larger vessels adjacent to the fracture, and trauma which interrupts blood supply tends to prevent bone repair, no matter how beautifully the reduction looks on the x-ray film. Surgeons are usually careful to preserve the circulation in the external tissues, though they often overlook the more essential point that the circulation to the bone itself must be intact, or must become re-established if it has been interrupted, before bone repair can occur. Long bones are nourished partly through the nutrient arteries, but at the epiphyses and about the joints the blood supply comes mainly from the periosteum and the ligaments supporting the joints. In the wrist, ankle and foot this latter source of blood is especially important, the carpal and tarsal bones being nourished almost entirely by intimate connections with the surrounding ligaments.

There has been much discussion over the importance of the sympathetic nerve control in bone metabolism. The discussion has gradually narrowed down to the mechanism of the control, its actuality being no longer disputed. Nerve control over bone changes is probably exerted through the sympathetic vasomotor circuit reflexly increasing or decreasing the rapidity of the blood flow through given areas. Whenever the rapidity of blood flow through bone is increased, calcium is taken out of the trabeculae; when stasis of circulation occurs, calcium tends to deposit.

Lerihe and Poligard make much of the importance of a local surcharge of calcium produced by the breakdown of normal or devitalized bone, in order to supply ready calcium for new bone. The necessity for this is disputed by Key and others who call attention to bone formation in tissues where there is no pre-existing bone, and to the growth of bone in the embryo. The proponents have ready answer to these objections, claiming that the local surcharge of calcium for bone formation in the embryo is furnished by the mother, calling attention to the osteoporosis of pregnancy where the mother gives up her own bone calcium to supply the demands of the growing child.

In the final analysis, the actual preciptiation of calcium out of plasma is brought about by the enzyme phosphatase. This enzyme probably is secreted by osteoblasts and splits the phosphate esters of the plasma into insoluble inorganic salts which are then precipitated.

The conversion of deposited calcium into bone tissue must be done by cellular activity. Callus is not bone and entirely too often is not converted into bone, but remains as inert in-

organic deposit unable to perform the function of osseous tissue. The osteoblasts, the osteoclasts and other living cells, with the help of ingrowing capillaries to supply the food materials, eventually transform callus into bone tissue.

Concomitantly with the cellular activity in forming bone tissue, there must be exerted the same forces which brought about the transformation of calcium storehouses into organs of support and locomotion in the evolving organism—the mechanical stresses and strains of use. Every surgeon knows that in treating a fracture, the time comes in the process of repair when rest becomes harmful and functional use is demanded if repair is to continue. The usual idea is that this resumption of function is for the purpose of restoring the lost tone of muscles and ligaments; this is true but it is just as true that function is required for the conversion of callus into living bone and developing the architecture of support in this bone tissue.

A better understanding of bone metabolism may be gained by a brief survey of the osteomalacias which result when some of these factors are lacking. According to Morse, malacias of bone may occur from any of several primary defects in metabolism or osteogenesis.

When there is a primary defect in the mesoblast so that insufficient connective tissue groundwork is laid down, bone will not form. In these conditions there is no lack of calcium and no defect in calcium metabolism, but without pre-existing embryonic connective tissue, bone cannot develop. This condition is found in osteogenesis imperfecta of infants and in fragilitas ossium of adults.

In some conditions there is no lack of connective tissue groundwork, but there is an insufficient intake of calcium or a deficiency of vitamin D, or a combination of these, and lime does not deposit in normal manner. Examples of these conditions are infantile rickets and adult osteomalacia.

Where the primary defect is in retention of phosphorus. There is alteration of the pH of the plasma with bone decalcification. The most striking example is in so-called renal rickets, which occurs in chronic arteriolar nephritis. This produces the most striking halisteresis found in any disease, and is usually accompanied by parathyroid hyperplasia.

The primary defect may be endocrine, as in hyperparathyroidism. This brings about a removal of calcium from the bones frequently followed by its redeposition in abnormal areas; to this group belong, with more or less certainty, osteitis fibrosa cystica, osteitis deformans or Paget's disease, certain types of arthritis—particularly the ankylosing spondylitis of Marie-Strumpell—leontiasis ossium, multiple giant cell tumors and possibly multiple myeloma. Calcium imbalance, with loss of calcium from bones occurs in hyperthyroidism, pancreatic diabetes and in basophil adenomas of the pituitary.

The primary bone defect may be local, due to disturbances in circulation as in acute bone atrophy, to pressure effects (as in Schuller-Christian's disease, Niemann-Pick's disease, Hodgkin's disease of bone, malignant metastases or primary new growths of bone) and to infections.

Having in mind these systemic and local factors which must be in physiologic harmony before bone tissue can form, what is the mechanism of such formation?

Connective tissue is universal throughout the body, not only as the tissue of support but also as the tissue of repair. Whenever an injury occurs, it is quickly followed by the formation of embryonic connective tissue. It is still a matter of dispute how the embryonic connective tissue of repair arises, whether it is newly formed from wandering cells (lymphoblasts, histiocytes) attracted to the point of injury, whether it develops by the multiplication of fibroblasts in the already existing connective tissue reticulum, or whether pre-existing connective tissue of differentiated type undergoes reversion to the embryonic state. It is an exceedingly interesting question with definite bearing on many problems of inflammation and repair, but a question into which this paper cannot go. It must suffice for us to remember that in response to and in consequence of injury, however slight, embryonic connective tissue does arise and proceeds to repair the tissue damage by a sequence of changes which transforms the embryonic tissue into a more specialized form. (6) With bone repair there is a definite sequence of events: (1) The ap-

pearance and formation of embryonic connective tissue; in cases of fracture the blood clot organizes and is transformed into granulation tissue. (2) Edematous infiltration of the granulation tissue occurs, the whole traumatic area becoming swollen and hard; this edema is of a peculiar type and is found only in localities and tissues where calcium is to be deposited; if it is lacking at the site of a fracture, nonunion should be anticipated. (3) Contemporaneous with the edematous infiltration, the fibrillar network becomes augmented, swollen and more sharply defined; these fibrillae are to become the fibers of Sharpey of bone tissue. (4) In the network of modified connective tissue fibrils there appears a homogeneous substance, viscous and resistant, called the pre-osseous substance or osteoid tissue; the marginal lines formed by this substance have the arrangement of future bone trabeculae; the pre-osseous framework pushes out in all directions without orderly arrangement; the direction of the bony trabeculae are determined by mechanical stresses. (5) Almost immediately after the appearance of the connective tissue latticework, calcium begins to deposit, and this deposition continues to follow the pre-osseous framework; the deposit of calcium diffuses itself throughout the modified connective tissue. (6) The architectural organization of the bone tissue is determined by mechanical stresses orienting the trabeculae in definite directions.

It may appear to be a far cry from these principles of bone physiology to a practical application of them in treating bone injuries. However, this paper will fail of its purpose unless such practical application can be suggested. Hours might be consumed in discussing even briefly the various lesions or groups of lesion in which the principles set forth have direct bearing. A typical example or two will be used, merely to assist in fixing the principles in our minds. The repair of bone injury always takes place by an orderly process of physiologic bone regeneration, in which the factors discussed interplay and exert their influence. The repair of fractures and the causes of failure to repair will be discussed in greater detail in another paper of this symposium. A condition which brings to mind several important points in bone metabolism and to which little attention is given by the average surgeon is a traumatic lesion first described by Sudeck 35 years ago and variously designated Sudeck's atrophy, acute bone atrophy, acute traumatic osteomalacia, traumatic osteoporosis, post-traumatic painful osteoporosis. So important is this condition regarded in Europe that it has twice within the past 10 years been made the subject of chief discussion at the German Orthopedic Congress; of the approximately 100 articles in the literature on this subject, only 10 are in English and until the past two years only one article had appeared in English on this subject. The lesion usually occurs in the extremities or in the spine, following what seems to be a mild trauma; in the lower extremity, a sprained ankle is the usual diagnosis. After a few days the ankle appears more swollen and discolored; motion will be painful, often excrutiatingly so. X-rays in the beginning will show no bone change, but after a period of time varying from a few days to two or three weeks, a peculiar patchy calcium loss can be observed, with localized areas of rarefaction in the heads of metatarsal bones; these may be so sharply circumscribed as to suggest localized infection. After a few weeks, the joint outlines of tarsal bones will disappear and the whole tarsus takes on what has been aptly described as a melted-ice appearance which doubtless is often diagnosed as tuberculosis or pyogenic infection. The condition is preeminently one of interference with the circulation or vascularity of the bones; it may be due to direct interference by tearing of the intimate connections between bones and ligaments through which the bones are nourished, or it may be by reflex effect through the sympathetic nerves, upsetting the vasomotor control. By increased speed of circulation the calcium is literally washed out of the bones and redeposited in the soft tissues which become stiff, edematous and eventually fibrotic.

Henderson has stressed the necessity for understanding the condition and correctly evaluating the pathology, if a long period of disability is to be avoided. The treatment is totally different from that usually given a sprain. Sudeck's atrophy is not to be treated by plaster casts, splints or even long periods of rest. Persistent functional use and muscular activity, with heat and massage, in spite of pain or discomfort, are the measures devised. If a case

of acute traumatic osteoporosis is placed in a cast further structural changes and a long period of disability will certainly result, and very likely permanent damage will follow. The condition described by Gordon as post-traumatic peri-articular fibrosis is probably this same type of lesion. The so-called traumatic spondylitis of Kummel probably has the same causative mechanism as Sudeck's atrophy. That type of spine injury requires the same fine discriminating judgment on the part of the surgeon as regards adjustment of rest and functional activity.

Examples could be multiplied but enough has been said for the purpose of this preliminary paper, which is to bring to mind the importance of a knowledge of bone physiology and call attention to its intimate bearing on the handling of industrial injuries. A fracture is not just a broken bone which will heal if placed at rest. It is an injury in a living tissue which is exceedingly complex in structure and metabolism. Not only is it an injury to a living tissue, but that tissue is an integral part of a living organism whose every resource needs to be focused on the reparation of the injury, if we are to expect complete regeneration and restoration of function. An often quoted extract from Leriche and Poligard's monograph opens up for us the horizon of our endeavor in treating bone lesions:

"The problem of osteogenesis has passed through many phases. It has been histological and surgical, and at the present time is above all chemical. . . . Chemists and physicists alone can open up new horizons by giving us some of the certainties we lack. . . When they have solved certain pending questions, we can then progress and perhaps have bone formed at will, accelerate the union of fractures, and prevent the pathological rarefactions of bone."

Since this was written very definite progress has been made toward this goal, and our chief problem is rapidly becoming one of making use of the material which research is continually supplying.

CLINICAL DIAGNOSIS BY LABORATORY METHODS—by James Campbell Todd, Ph. B., M.D., and Arthur Hawley Sanford, A.M., M.D. W. B. Saunders Company.

This is the eighth edition of this popular laboratory work. Much new matter has been added to this volume which has been so well and popularly known that there needs to be little said about it by a reviewer. The publishers have done their work in as nearly an ideal fashion as is possible. A world of matter is crowded into relatively small space. Although there are nearly 800 pages the book is easy to handle and not unduly heavy.

BONE REPAIR AND FAILURE AFTER FRACTURES

E. PAYNE PALMER, M. D.
Phoenix, Arizona

The complete fracture of a bone usually results in tearing of the endosteum and the periosteum with damage to surrounding soft structure. Blood vessels are ruptured. Blood is the most important factor in the repairing of fractures. Organization of the hematoma is the first step in the reparative process; if the bone fragments are in proper alignment and close apposition the hematoma will fill in the gap between the ends of the bone and the broken off fragments and the surrounding space. Edema is a hindrance. Invasion of the hematoma by fibroblasts form granulation tissue and capillary sprouting. Up to this stage the process is practically the same as in the formation of granulation tissue in the healing of soft tissue.

Bone is connective tissue which contains specialized cells, the osteoblasts. The endosteum and periosteum play important parts in bone repair. Following injury to these structures, the internal vascular or osteogenic layers give off the osteoblast and they in turn invade the mass. There is now a mass of loose meshed, friable, organized tissue uniting the ends of the bone, unless there has been a failure to properly adjust the ends or there is an interposition of tissue between the ends of the bone. Calcium is deposited in the newly formed tissue, this being the beginning of the callus formation, after about 72 hours.

Robinson has demonstrated an enzyme, phosphatase, that causes the precipitation of calcium phosphate, produced by bone cells on the ends of the fractured bone and the broken off fragments. It is taken up by the hematoma and stimulates deposition of calcium salts. Potts has demonstrated that no appreciable calcium is deposited at the site of a fracture in the absence of a hematoma; in hematomas produced in the abdominal wall and fascia sheaths, failure to detect calcium was constant; therefore, he concludes that the hematoma about a fracture is a suitable medium for the deposition of calcium salts and for the formation of bony callus, and that fibrin is less effective

than blood as a medium into which osteoid tissue may grow.

When a hematoma fails to form, a weedy connective tissue overgrows the space between the broken ends and fibrous union occurs. If the bone ends are not brought into apposition and alignment, normal repair will fail and the ends will be sealed over by fibrous deposit.

The bone cells develop first as a gritty matrix and then a mass of callus of indeterminate consistency. The healing process continues until there is a dense concentration of calcium phosphate in the newly formed tissue and until firm bone results.

The vessels of the callus grow in from the medulla, the periosteum and the surrounding soft tissue. The new haversian canals run at right angle to the shaft. Rearrangement of the circulation and of the haversian canals are carried out gradually. Restoration is not complete until the newly formed bone has assumed an orderly structure in anatomical harmony with the rest of the bone. This comes with return of function and over a period of months. The bone cells gain strength in response to stress and strain repeatedly applied. This stress and strain must be applied gradually. A healed fracture should not be put to work too soon.

Exuberant callus is gradually absorbed as is also the granulation tissue and fragments of bone not concerned in the healing.

The calcium-phosphorous balance and metabolism in relation to the repair of fractures has been given careful study and investigation, but we know little of the physiochemical changes that turn calcium and phosphorus into bone. Radvin and Jonas who reviewed the literature and carried on careful investigation conclude that in the normal individual the metabolism of these elements plays only an indirect role in delayed or non-union and that other factors well understood play the major role; deficient retention and fixation of calcium and phosphorus may result in non-union. Speed concludes that it is impossible to prognosticate inadequate union by estimation of serum phosphorus-calcium, and that ordinary dietetic methods and administration of calcium salts do not appear to affect the rate of flow of calcium away from or into the bone. The parathyroids govern the calcium level of the blood, but it has not been proven that they influence the deposit of calcium in fracture repair.

The delayed union is a condition in which bone repair is progressing slowly as shown by physical and x-ray examinations. Non-union is a condition in which solidifying bone formation has not occurred. Delayed union may progress to non-union. If a time limit is to be placed, we may consider delayed union existing if satisfactory bone healing has not taken place in from six to 12 months. If after exhausting all means to promote solid bone union, short of an operation, for six to 12 months and the bone ends fail to unite, the case is classed as one of non-union. It is estimated that delayed union occurs in 1.25 per cent of fractures and non-union in from two to three per cent. Delayed union and non-union usually occur in persons in apparently good health.

The causes for failure to repair normally are many—local and constitutional. The local causes are far more significant and many of them can be prevented and corrected.

Among the local causes are severe traumatizing injuries to both bone and soft structure impairing vitality and blood supply, multiple fractures, compound fractures, interposition of soft parts and bone fragments between bone ends, loss of large fragments of bone, malposition of the ends of the bone, inadequate reduction without apposition of bone ends, improper alignment and fixation, after proper reduction too much traction, disturbance of the circulation by tight bandaging and thick tight plaster of Paris cast, immobilization for too short a time, too early weight bearing and use, bone tumors, cyst, metastatic carcinoma and sarcoma, gumma, bone tuberculosis, osteomalacia, local severe sepsis, absorption of solid callus before complete restoration of trabecular alignment has been completed, and others too numerous to mention.

As a rule, constitutional conditions are not important factors in the cause of non-union. Kolodny concludes "that endocrine disturbances play a prominent role in the suppression of regeneration process of bone." Among the general causes are syphilis, anemia, malaria, starvation, severe hemorrhage, pregnancy, lactation, acute febrile diseases, diseases of the central nervous system, acute and chronic nephritis, erysipelas, diseases of the bone result-

ing in decalcification and many others of less importance.

The middle third of the humerus and the neck of the femur are recognized as localities where delayed union and non-union are likely to occur, due to deficient blood supply and cancellous character of the bone. Failure to repair in the neck of the femur is the rule rather than the exception; only 57.6 per cent of satisfactory results are obtained.

Surgeons have no power to repair directly any injured tissue. We have no treatment, dietetic, medical or surgical, that will guarantee to repair a fractured bone. The repair must be attained by the activity of the body cells.

The surgeon's duty is to carefully take and record a complete history and make a careful physical examination in every fracture of any consequence, to reduce the fracture quickly, obtaining and maintaining close apposition and true alignment of bone ends and fragments, to protect the organizing matrix and the young cells as they develop and to allow unrestricted circulation to the injured parts.

Bancroft believes that if a fracture is immediately treated in a manner which will replace as far as possible the fractured ends in suitable apposition allowing organization of the clot and the ingrowth of granulation tissue with its accompanying vessels, repair will invariably follow. We do have delayed union and non-union even when this treatment is carefully followed.

There is a great need for better anatomical reduction of fractures, a more detailed application of splints and appliances, a closer follow up, and careful, frequent observations of the progress of healing.

Delayed union calls for special care and watchfulness. The slow bony union may be coaxed into perfect bone repair.

Meddlesome surgery in delayed union should not be sanctioned. A varied, nutritious diet, including calcifying nutrients, acidified milk, egg yolk, high visceral proteins, fats of fish and meat, fresh fruits and vegetables are needed. The acid milk furnishes an abundance of calcium-phosphate salts; vitamin D catalyzes these salts. Fresh air, sunshine, local heat, superficial massage, violet rays, and diathermy are beneficial. Delayed unions frequently heal rapidly and satisfactorily when cautiously used.

The successful treatment of non-union can only be obtained by surgical technique, combined with the methods suggested to hasten repair in delayed union.

If there is infection at the site of the fracture one should wait three to four months from the time the skin healed and then for three days give firm massage at the site of the fracture and watch for local and systemic reactions. If none occurs, proceed with caution.

The autogenous onlay graft is the operation of preference and the graft so applied is of the greatest service in the stimulation of osteogenesis. Grafting opens up large areas of raw bony surfaces and gives a higher percentage of bone repair than does any other method. In the operation for non-union of bone the fibrosed eburnated bone should be freshened and the graft should be massive and extend at least two inches beyond the sclerosed bone ends. Sclerosed bone has no further power of bone growth. Fixation must be as near as possible complete, and while we should avoid its use if possible, one may be compelled to resort to hardware to aid in fixation. All bone chips freed at operation should be inserted about the graft and a hematoma allowed to form at the site of the bone operation to begin the process of repair before the operation is complete. If the bone ends and the graft are kept in good apposition and alignment new bone will form and ultimately resemble the original bone in form, structure and strength. I have found it also necessary to use skeletal traction to maintain alignment and fixation.

Drilling the bone ends through small skin punctures opens blood vessels resulting in clots to receive the liberated osteoblast from the inner layer of the periosteum and endosteum, thereby stimulating bone repair with gratifying results.

Interested interns and nurses who will pay constant attention to details are needed to assist in these cases, as it is impracticable to attempt to have every nurse in the hospital trained to care for fracture patients undergoing treatment for failure to repair.

CONCLUSIONS

The detailed process of repair after the fracture of a bone should be thoroughly under-

stood by everyone who attempts to treat fractures.

The formation of a hematoma is essential for normal bone repair after fracture.

We have no method by which the calcium-phosphorous balance can be measured so as to prognosticate repair of fractures.

Causes for failure to repair normally after bone fractures are local and preventable in the majority of cases.

Treatment of a fracture should be centered more upon the local findings and immediate careful handling of the injured parts than upon the general metabolism of the individual.

We have no treatment that will guarantee to repair a fractured bone. This must be done by the body cells, the action of which is little known.

Early replacement of the fractured bone ends in as nearly perfect apposition and alignment as possible and perfect immobilization to protect the matrix is essential for normal bone repair.

Delayed repair calls for special care, probably not had at the proper time in most cases.

Failure to repair calls for surgical intervention and careful watchfulness, until complete repair has been attained.

BIBLIOGRAPHY

Potts, W. J.: The role of the hematoma in fracture healing. Surg. Gyn. and Obst. 57: 318-324. 1933.

Ravdin, I. C., and Jonas, L.: Studies of calcium and phosphorus metabolism in the fracture of bones. Ann. Surg. 84: 37-41, 1926.

Sneed, W.: Ununited and delayed union of fractures. Ky. Med. Jour., 30: 363-370, 1932.

Speed, K.: Blood serum calcium in relation to the healing of fractures. Jour. Bone and Joint Surg. 13: 58-67, 1931.

Swart, H. A.: Effect of irradiated ergosterol on healing of experimentally produced fractures in animals. Jour. Bone and Joint Surg. 12: 360-368, 1930.

Taylor, R. T.: Newer methods of treatment in non-union of fractures. Surg. Gyn. ond Obst., 862-867, June, 1925.

Wilson, M. J.: Blood chemistry in ununited fractures. Jour. Am. Inst. Homeop. 23: 334-335, 1930.

Wolcott, W. E.: Circulation of the head and neck of the femur; its relation to non-union in fractures of the femoral neck. J. A. M. A. 100: 27-34, 1933.

The Principles and Outline of Fracture Treatment. Bull. Am. Coll. Surg. 15: March, 1931.

Albee, F. H.: Principles of the treatment of non-union of fracture. Surg. Gyn. and Obst. 51: 289-320, 1930.

Bancroft, F. W.: Process of union after fracture. Ann. Surg. Oct., 1929.

Blake, J. A.: Repair of bone following fractures. Arch. Surg. 2: 37-44, 1921.

Brickner, W. M.: Metal bone plating a factor in non-union. Autoplastic bone grafting to excite osteognesis in non-union of fractures. Am. Jour. Surg. Jan., 1934.

Campbell, W. C.: Ununited fractures. Arch. Surg. Chicago, 8: 784-90, 1924.

Campbell, W. C.: Ununited fractures. Arch. Surg. 24: 990-1015, 1932.

Eden, R.: Healing of fractures. München. med. Wchnschr. 53: 1160-1164, 1924; Abst. J.A.M.A. 83: 1041, 1924.

Estes, W. L., Jr.: A study of the causes of delayed union and non-union in fractures of the long bones. Ann. Surg. 1920.

Forrester, Brown, M. F.: Treatment of ununited fractures. Lancet, 245-246, and 305-306, 1927.

Girdlestone, G. R.: The union and consolidation of a fracture. Am. J. Surg. 38: 129-131, 1924.

Henderson, M. S.: The treatment of ununited fractures. Ann. Surg. 72: 487-494, 1921.

Henderson, M. S.: Causes of delayed union of bones. Minn. Med. 12: 529, 1929.

Henderson, M. S.: Ununited fractures. J.A.M.A. 86: 81-86, 1926.

Henderson, M. S.: The treatment of ununited fracturse, Ann. Surg. April, 1921.

Henderson, M. S., and Sandiford, K.: Ununited fractures with special reference to the chemistry of the blood. Jour. Bone and Joint Surg. 8:607-617, 1916.

Hitzrot, J. M.: The cause and the treatment of non-union. Am. Jour. Surg. 7: 50-54, 1926.

Kolodny, A.: Endocrine disturbances and non-union of fractures. Surg. Gyn. and Obst.: 739-797, 1924.

MacAusland, A. R.: Fractures: Publications of the MacAusland Orthopedic Clinic, Book Four, 1931.

Nutter, J. A.: On delayed union and non-union of fractures. Jour. Bone and Joint Surg. 4:104-128, 1922.

Owen, W. B.: Ununited fractures of the shaft of the humerus. J.A.M.A. 101: 569-571, 1933.

DISCUSSION by R. O. Schofield, M. D., Boulder City, Nevada: Repair of bone tissue requires events similar to the repair of connective tissue, plus the added event of the deposition of calcium. Details of the physiology of bone repair are controversial, though I believe all are agreed that a hematoma at the site of fracture is necessary. The hematoma, composed of local tissue fluids is the site of the simultaneous processes of regeneration and absorption. The medium possesses an acid pH and as such it allows for the optimal proliferation of osteoblastic reconstruction that leads to the formation of new blood channels and haversian canals. As the process proceeds there occurs a gradual natural change to the alkaline side necessary to deposit calcium, obtained locally or from the blood in callus. This biochemical response is probably controlled by the osteoblasts themselves although the deposition of lime salts may be purely a physiochemical reaction as suggested by Bancroft, or, it may be due to the influence of the phosphatase as outlined by Robinson in his studies

upon bone metabolism. Bone repair is complete when sufficient lime salts have been deposited to produce solid union.

Factors causing non-union are: (1) Incomplete and improper reduction of fragments so that granulation can not bridge the defect; likewise the interposition of soft tissue prevents the formation of adequate granulation tissue. (2) Inadequate immobilization or too early manipulation injures the newly formed tissues; such injury prevents normal granulation tissue from forming the preosseous matrix and causes it to form only scar tissue; lime salts cannot be deposited in scar tissue. (3) Inadequate blood supply to the fracture area. (4) Infection has a definite destructive action on new bone elements and tends to prevent union, possibly by its ability to disturb the biochemical medium of local tissues; acute infections, however, may stimulate granulation. (5) Failure of ossification is probably dependent upon what has previously occurred to the granulation tissue.

Successful treatment of non-union requires both mechanical and physiological consideration. I believe it is best carried out by the use of the onlay graft which has been popularized by Campbell and others. This is a less difficult procedure than the inlay double wedged end graft of Albee's which also gives excellent results. Drilling holes in the ends of the ununited bones as advocated by Beck of Kiel and Bohler of Vienna, I have not tried. I do not believe that the osteoperiosteal graft of Ollier, the intramedullary graft, the step up operation of Senn, or the use of various forms of mechanical fixation are to be recommended. The onlay and inlay processes are physiologically as well as mechanically correct and give excellent results.

It has been my opportunity at Boulder Dam to treat or to immediately supervise the treatment of more than 1500 fractures during the past 26 months. Less than 10 fractures have been treated with open reduction. Non-union has not occurred in any of the usual fractures where one might expect to find it. An ulnar styloid, two small tip fractures with widely separated fragments from internal malleoli, and one fractured tibial spine healed by fibrous union on the inter condyloid ridge in a knee, represent our total number of non-unions. The inter-condyloid ridge fracture is the only one with functional disability, and the industrial commission held that open operative procedures could not improve the stability of the knee and might make it worse.

The showing of practically no non-unions in this series is attributed to the following: (1) Closed reductions almost without exception; (2) fractures seen early; (3) compound fractures debrided and converted into simple fractures wherever possible; (4) accurate reduction and skeletal traction as advocated by Bohler; (5) non-padded plaster casts for absolute immobilization and fixation until the x-ray demonstrates the presence of sufficient callus formation; (6) active muscular use of uninjured portions of the extremities to insure proper blood supply to fracture areas; (7) cautious manipulation and careful, frequent follow-up examinations; (8) recognition of delayed union cases and these treated by external fixation splints or casts or walking stirrups, all of which used in conjunction with active exercises and frequent follow-up examinations.

With this definitely established routine in the immediate accurate reduction of fresh fractures, followed by sufficient absolute fixation, cautious manipulation, preservation of proper blood supply, and careful follow-up examinations it is my experience that non-unions will be negligible, and complete bone repair expected.

It has been a privilege to discuss the papers which show thorough appreciation of the entire subject. I particularly would refer to Dr. Palmer's statement: "We have no treatment that will guarantee to repair a fractured bone; this must be done by the body cells the action of which we know very little."

DISCUSSION

DR. JOHNS: Both Dr. Watkins and Dr. Palmer have said much about circulation, all of which fits in with my paper as given this forenoon. These two papers are distinctive contributions to the study of bone injury and repair. I express my compliments and appreciation.

Dr. Wilkinson: Dr. Palmer speaks of five per cent non-unions. How does he check up to know he gets union? Are too many x-rays ordinarily taken?

Dr. Greer: Dr. Watkins and Dr. Palmer in these two able papers have really given us something we can take home and study. I also commend Dr. Schofield on his clear-cut discussion. It occurs to me that often we open reductions too soon. Everything possible should be done first and resort to open reduction only as a final measure. Perhaps

we x-ray too often. I should like to ask about this. There is a relatively small number of non-unions. Modern diet and use of sunshine undoubtedly has much to do with this. It is a shame to pass by these two papers without the discussion due them. All we can do in this brief time is to thank Drs. Watkins, Palmer and Schofield for what they have brought us and to profit thereby.

Dr. Duncan: I ask Dr. Schofield whether or not there is a considerable number of non-unions in his cases of multiple fractures.

Dr. Sult: No one has said anything about the application of heat for delayed unions. I should like to ask about this.

Dr. Palmer Dysart: I should like to ask Dr. Schofield how many cases of fracture of the head of the femur there were among his 1,500 cases.

Dr. Schofield: Answering Dr. Dysart, there were only two cases of fracture of the head of the femur in the number of cases cited. The ages represented range from 31 to 35½ years; this probably accounts for the lack of this type of fracture. As to multiple fractures our greatest number at Boulder has been 22, with 17 and 10 in second and third ranking respectively. Relative to non-unions in these multiple fractures, there have been none except for a sliver fracture. As to Dr. Greer's question relative to a possible over-use of the x-ray, our experience at Boulder has been to take as many as we like without fear of resulting trouble. I emphasize that the doctor himself must see these cases, often several times a day and not entrust the care to nurses and orderlies.

Dr. Watkins (concluding): The only effect the use of the x-ray would have on the fracture would be to hasten the union to develop calcium, and is not strong enough under modern technique, to blast the cells. Some physicians may take too many x-rays from the standpoint of the patient's finances. The problem is economic and not biologic. Dr. Schofield has given us new thoughts on bone physiology. For this we are grateful. In non-union there are a number of deductions to make or consider. There is the lack of ability to maintain or retain vascularity. Calcium does not become bone until capillaries have invaded it and converted it into bone. Until functional use of the bone is restored its architecture is incomplete. Along with Dr. Schofield I, too, should like to stress Dr. Palmer's point that there is no treatment that will guarantee to repair a fractured bone. We do not know what is needed through the blood serum. I hope to live to see the day when we do know this and will be able to tell the patient just what is lacking.

Dr. Palmer (concluding): Dr. Schofield's discussion is a valuable contribution to the subject of bone injury and repair. He has clearly shown what can be done and what we as individual surgeons should do. One fault is that we can not always get on the job early enough. Dr. Schofield has every facility to treat early and to see the patient as often as the case demands. Dr. Palmer, medical referee for the Industrial Commission, has asked me at times why I make so many visits to some of these patients. Dr. Schofield has answered this for me. Constant care on the part of the doctor is necessary. However, it imposes a financial burden on many patients which gives another problem that must be considered. That is a problem that concerns the doctor in private practice. The use of the x-ray varies in every case. If the case is one where proper alignment is doubtful, the x-ray must be resorted to frequently. All serious fractures must be x-rayed often. There is no harm in their use under modern technique outside of their effect on the patient's purse. Dr. Watkin's paper is most helpful. We should have more and more papers on physiology; its importance can not be overestimated.

CARPAL BONE INJURIES INDUSTRIALLY CONSIDERED

DR. R. F. PALMER, M.D., Medical Advisor to the Arizona Industrial Commission

In the consideration of injuries from an industrial standpoint, we are especially concerned with functional restoration of the injured member as relating to the occupation of the individual.

Carpal bone injuries industrially considered are therefore of importance in direct proportion to the importance of hand function in industrial life. Looking on the hand as a tool necessary in the manifold operations of industry, its functional importance becomes at once apparent, and any condition which interferes with the function of the hand is responsible for a proportionate loss in the industrial value of the individual.

Practically all functions of the human hand, such as thumb-finger apposition in the finer arts, grasping of large and small objects, prehension, carrying, et cetera, are dependent on the presence, strength, and flexibility, of the fingers. Without functioning fingers, the hand is of use only in pushing or in holding objects by pressure. Without function of the palm or carpo-metacarpal region, the fingers are of little value. So, too, the hand itself is useless without the arm to control and guide it.

Accidents causing injuries to the fingers or arms are usually immediately apparent and proper steps are taken to bring about as great a restitution of parts and return of function as the given injury may permit. In the carpus, however, there occur injuries not always easy of recognition in the beginning and capable of causing serious disfunction of the hand. It is to these injuries that I call attention, not from the standpoint of adding anything new to the medical literature, but for the purpose of emphasizing the industrial importance of permanent functional disabilities resulting from carpal injuries. The illustrative cases to be presented have come to attention in connection with my duties as medical advisor to the Arizona Industrial Commission.

First in importance, because the most frequent of the carpal injuries and often most serious from a disability standpoint, are fractures of the carpal scaphoid. This injury is not uncommon in industry. It is usually produced by indirect violence from falls on the hand extended in radial flexion. It is often associated with other injuries and dislocations of the wrist and carpals. It is only to be recognized early by means of the x-ray. Non-union of the fragments together with rarefaction or atrophy of the bone, associated perhaps with arthritis of the wrist, may lead to serious and prolonged industrial disability. Of the two cases of this fracture to be presented, one, complicated by other injuries in the same wrist, illustrates the difficulties sometimes met in diagnosis and treatment. The other shows the industrial end results where non-union, condensation of the bone and arthritis have occurred.

CASE NO. 1. E. D., white, aged 18. Referred for examination November 9, 1934, seven months following the injury.

History of Accident: The left hand was caught between a trailer and a truck body when they came together. The exact mechanism of the force applied is not known. Initial report was fracture of the radius and cuneiform, with dislocation of the carpus. The x-ray shows fracture of the styloid process of the radium, with dislocation of the proximal carpal row forward, the os magnum and cuneiform backward, with fracture of the cuneiform. After reduction of the carpal bones, under ether, the x-ray shows the carpal bones in proper position without displacement of fragments and with fracture of the cuneiform.

Because of the multiple injuries in this case, especially relating to the carpal joints, and because the fracture of the scaphoid was not recognized at the time, early passive and active motion was instituted. Several films taken along at intervals did not show fracture of the scaphoid clearly, but five months later the film shows the ununited bone. Some time later the attending surgeon reported a 75 per cent disability of the hand and asked for consultation to consider the advisability of operative treatment. Films taken at that time, November 9th shows the fragments of the scaphoid apparently united in good position. From another film taken on November 30th the fragments are again reported ununited. Manipulation under the fluoroscope also showed that union had not occurred, and finally films reveal the ununited fracture with condensation of both fragments.

The lesson to be learned from this case is to not underestimate the industrial seriousness of carpal injuries, and to realize that when prompt recovery is not made, it sometimes takes painstaking study to determine the exact pathology.

CASE NO. 2. C. W. O., white, aged 34. Referred for examination November 3, 1934, because of disability from a wrist injury sustained about five months before.

History of Accident: On July 16, 1934, when handling timbers, a 6x6 timber slipped and struck him on the back of the left wrist. From x-ray taken at the time a fracture of the carpal bone was reported.

The following additional history was obtained: In January, 1931, an accident occurred which resulted in a fracture of the left scaphoid, after which he returned to work on light duty in 42 days. He states that while the wrist bothered him, he managed to get along until nine months later when he was again injured, sustaining a contusion of the same wrist—fibrous union. At this time he was off work for 26 days; he states that he was unable to use his wrist with any degree of freedom without pain and weakness for a period of two years, and that following that period it was gradually getting stronger up to the time of the present injury.

For the past seven months the member has been treated conservatively in a cock-up splint. The industrial end result in this case is shown in the present condition of a painful, weakened wrist, limitation of motion equal to 50 per cent of normal, and an equal loss of grip and carrying strength. Present x-rays show the ununited fracture, in the increase in density of fragments, and the arthritis at the wrist point. The condition is apparently stationary—for the time being at least. Whether or not operative removal of the bone at this time would lessen the disability does not come within the scope of this paper.

Carpal bone injury of a somewhat different type and one which, while not of frequent occurrence, is of considerable industrial importance, is a traumatic osteoporosis of one or more of the carpal bones. This condition apparently affects the semilunar most often and is then usually referred to as Kienbock's disease of the semilunar. The same osteitic condition, when occurring in the scaphoid, is known as Preiser's disease. The industrial importance of this condition relates to the difficulties of early recognition and to the fact that by the time, perhaps months later, the disability has become sufficiently serious to be recognized, the original slight accident which may have been responsible has been well-nigh forgotten.

CASE NO. 3. T. B., white, male, aged 23, was referred for examination January 18, 1935, six months after the injury. The personal history is unimportant except a Neisserian infection six years ago and a similar infection contracted during the past three months.

History of Accident: On or about August 1, 1934, while changing a tire on a truck with two tire irons, one of the irons slipped. He thought at the time that it was the left one, and that he had sprained his left wrist, but now he thinks perhaps it was the right iron which slipped and flew over, hitting him on the left wrist. At any rate, the injury was apparently not severe at the time and he continued working, providing himself with a wrist

band. After a few days the condition seemed to get better, but it always troubled him a little. Some three or four weeks later he noticed that on grasping objects or lifting with his left hand, he had considerable. pain in the wrist. This condition became progressively worse, and about two months after the injury he consulted his surgeon. An x-ray taken at that time did not show a fracture and the case was treated as a sprained wrist over a period of a few weeks and then not heard from again until January 17th. The patient reported that following rest in a splint the wrist had apparently recovered, but on starting to use it again the pain and disability recurred. X-ray taken then showed an apparent fracture of the semilunar bone.

This case presents a rather typical history and x-ray appearance of Kienbock's disease, and is presented for the purpose of calling attention to this type of carpal injury purely from an industrial standpoint. When an apparently trivial injury to the wrist does not recover in due time, careful and painstaking investigation should be made that the diagnosis can be had at the earliest possible moment. While numerous dislocations, fractures and other traumatic conditions occur in the carpus, these few cases will call attention to the necessity for careful consideration of wrist injuries. As accurate diagnosis of lesions in this region can only be made by x-ray, early, well-taken and carefully studied diagnostic films are important.

THE TREATMENT OF CARPAL BONE INJURIES

J. M. GREER, M. D.
Phoenix, Arizona

I wish to emphasize things that all know and yet may not always act upon when treating carpal fractures.

The wrist is a complicated joint. The hand is united to the forearm by three joints: the radio-carpal, the intercarpal, and the carpometacarpal joints.

This discussion does not include the fractures of the lower end of the radius but these fractures are frequently associated with fractures of the carpal bones and have a direct bearing on the treatment. One might not be able to put up a fracture of the lower end of the radius as he would like to if complicated by a fracture of the carpal bones and vice versa.

In certain fractures of the posterior lip of the lower end of the radius the first row of carpal bones has a tendency to subluxate backward and if complicated with fractures of the carpus, the problem indeed becomes important.

Frequently a man receives an injury to his wrist and thinks it only a sprain and does not report for treatment, thinking that it will soon be better and he, many times, continues working unless his work is so heavy that it is impossible. Then when the case does not progress satisfactorily the man comes in and it is found that he has a fracture of the carpus. These fractures occasionally do not show up in the x-ray, not even in good films with proper exposure and proper development. The x-ray should be repeated in 10 days to two weeks, if there is any reason to believe that the injury is more serious than a sprain of the wrist. It is necessary to make an accurate diagnosis as the treatment of fractures of the carpal bones is different from the treatment of sprains of the wrist. In fractures long immobilization is necessary, while in sprains early active motion saves time. Treatment varies with the bone fractured. An associated dislocation should be determined, as this also varies the treatment. The complicating dislocation is usually of the semilunar. Because of its shape, it has a tendency to slip out of place when the carpal bones are compressed between the lower end of the radius and the hand. The dislocation should be reduced as soon as possible and before an attempt is made to treat the fracture.

The carpal scaphoid fracture is the most common of the carpus and comprises about 0.5 per cent of all fractures. It is commonly seen in young men and the frequency of the fracture of this bone is because the scaphoid and semilunar transmit the force of the lower end of the radius. Because of the shape and position of this bone it has a tendency to fracture while the semilunar has a tendency to dislocate or slip out of place. The great majority of these fractures are caused by falls upon the hands. In most cases the fracture is irregular across the bone near the middle. Occasionally the bone is comminuted and may be intra-articular with little displacement. This may lead one astray in the treatment as the first x-ray would show no displacement and an insecure dressing used. When the x-ray study

is made at the end of two weeks or later, instead of a nice little crack with no displacement, a fracture with separated fragments is found.

In the cases of fracture of the scaphoid associated with, dislocation of the semilunar or, fracture of the semilunar or, fracture of the lower end of the radius or, the lunar styloid, the additional injuries must be taken into consideration in the treatment. A crack across the scaphoid may be enlarged into a gap with large separation of the fragments after the manipulation necessary to replace a dislocated semilunar. It is best to check up after the manipulation.

Absolute immobilization for a long period of time of all carpal fractures is necessary. Our usual difficulty is in not starting the treatment soon enough. Many times we do not see the patient at first and do not have an opportunity to start early treatment.

Ready made splints are never adequate. They do not fit and they never immobilize the thumb, which is necessary. The most adequate splint is a circular cast snugly applied from the upper third of the forearm to the metatarsal phalangeal joint of the fingers and the interphalangeal joint of the thumb. The best position, usually, is a slight cock-up and radial flexion or abduction with the thumb in abduction. This approximates the styloid of the radius and the trapezoid against the outer fragment and compresses the outer fragment against the inner fragment which is jammed up against the os-magnum. In this way the broken fragments can be held in approximation. This cast is left on eight to 12 weeks, better 12. If it becomes loose it is removed and another immediately applied. The cast is removed permanently only after satisfactory x-rays have been taken showing union, and this regardless of the length of time.

In old cases the treatment is prolonged immobilization in tight skin fitting casts in such a way that the fingers can be used to stimulate blood supply. The next thing to try in case of failure is drilling of the fragments with a fine drill or even inserting a small autogenous bone peg after the drilling. Removal of ununited fragments of the scaphoid is not good treatment if it can be avoided. A crippled wrist invariably results. It may be the lesser of two evils; that is the cripling may be less after the broken fragments have been removed but it may be greater. In removal good results depend largely upon early active motion. Physical therapy helps and should be used. Active motion is most important, and as definite exercise with something definite to do. Considerable disability must be expected.

Treatment of fractures of other carpal bones is also based upon the above outlined principles. These fractures are not so often seen except in crushing injuries where there is a large amount of injury to soft parts as well as bones. Ankylosis of the carpal bones and marked disability is the usual result in spite of treatment.

In summing up: Be sure that the case thought to be a sprain is not a fracture. Long adequate immobilization is all important. Immobilize in such a way that the fragments are held together. Do not remove the cast too soon, and do not be in a hurry to remove the cast in order to start passive motion and physical therapy. In old cases long immobilization drilling the fragments or the insertion of small autogenous bone pegs may accomplish union. A fibrous union is not inconsistent with good functional result. Do not be in a hurry to remove these fractured bones and fragments, as the results after removal are often unsatisfactory.

REVIEW OF THIRTY-ONE CASES OF CARPAL BONE INJURIES

WM. B. WATTS, Jr., M.D., F.A.C.S.
Miami-Inspiration Hospital, Miami, Arizona

Of the 603 cases of wrist fractures treated at the Miami-Inspiration Hospital from 1917 to 1934, there were 31 cases involving fracture of the carpals. In these 31 cases carpal fracture occurred 34 times—the incidence was one in 19 of all wrist fractures seen. There were 30 males and one female; their ages ranged from ten to 44 years. The left wrist was fractured 16 and the right 15 times. Fracture was produced by transmitted force in 18 instances and by direct violence in 13 others. More than one carpal was fractured in three cases, the os magnum and unciform in two, and the scaphoid and cuneiform in one. There were 14

associated wrist fractures, and there were associated fractures of other bones in 11 cases, and six times both associated wrist and other fractures were present. The carpals involved in order of frequency were: Scaphoid 21, cuneiform four, semilunar three, os magnum two, unciform two, pisiform two, trapezium none and trapezoid none.

Fractures of the Scaphoid (Navicular) Bone: Scaphoid fractures encountered were: Twelve transverse, four comminuted, four avulsion, and one compression.

The associated wrist fracturse were: Radial styloid six; fracture of the radius and ulna two; and in one case, there was a perilunar dislocation.

Other associated fractures were: Head of the radius one, fracture of the mid third of the radius and ulna one, multiple phalangeal fractures one, fracture of the radius of the opposite arm one, compression fracture of the second lumbar vertebra one, fracture of the coronoid process of the ulna one, and in one case, there were extensive destructive wounds of the forearm with fracture of the upper third of the radius and ulna.

Fracture of the Cuneiform (Triangular) Bone: In the four cases of fracture of the cuneiform the bone was comminuted in every instance, and the fractures were associated with other lesions of the wrist. In one there was a transverse fracture of the scaphoid with fracture of the radial styloid—in another, dorsal dislocation of the distal row of carpals and fracture of the radius and ulna; in a third there was extensive comminution of the lower end of the radius; and in the fourth there was an associated fracture of the radial styloid.

Other associated fractures were: Fracture of the opposite radius and ulna two, fracture of the internal malleolus of the right tibia one, comminuted fracture of the right tibia and fibula and six ribs one.

Fracture of the Semilunar (Lunate): Fracture of the semilunar occurred three times, and there were no associated wrist or other fractures. In one case the injury was not reported for more than two months, and the man refused to have the wrist immobilized. He continued to work and four years later there was no evidence of any impairment of wrist joint function.

Fracture of the Os Magnum (Capitate) and Unciform (Hamate) Bones: Fracture of the os magnum and unciform are considered together here as in both of our cases the lesions were associated—once in the right and once in the left wrist. Both were produced by direct violence, and in one case there was an associated fracture of the radial styloid.

Fracture of the Pisiform Bone: There were two fractures of the pisiform, one of which refused treatment because of the trivial disability, and the other was treated 38 days, primarily for an associated fracture of the base of the third metacarpal.

Treatment: Our carpal fractures have been treated along conservative lines. There has been no hard and fast rule as to the position in which the injured wrist was immobilized. However, in the scaphoid fractures unassociated with other wrist fractures or where these latter were of minor importance, the most satisfactory position and the one which better approximates the fragments and gives the greatest comfort to the patient is to place the hand in a cock-up position and slight radial flexion. In recent years we have discarded the cumbersome cock-up splint, and use instead a molded plaster of Paris cast which is changed two or three times during the period of immobilization for the purpose of gaining all extension of the wrist possible. Several of the fractures had to be treated with due regard for more important wrist fractures and apparently did just as well when the wrist was immobilized in a different position.

Temporary Disability: Temporary disability is considered here under five headings. In eight cases of carpal fracture unassociated with other fractures, the total loss of time was 244 days, the average being 35 days per case. In eight cases of carpal and associated wrist fractures, the total loss of time was 589 days, averaging 73.62 days. In five cases of carpal and other associated fractures, the aggregate time lost was 232 days, the average, 46.40 days. In six cases of carpal, associated wrist and other fractures, the total time lost was 1408 days, average was 234.66 days. There were two cases of reinjured carpal fractures; in one case the wrist was reinjured once; the time lost on account of initial injury was 55 days, and on account of reinjury, 65 days; in the oth-

er case the wrist was twice reinjured with time lost on account of initial fracture being 42 days, first reinjury 26 days, and second reinjury was 168 days. Total time lost in the two cases was 346 days, and the average was 178 days.

End Results: The follow up period in this series of carpal fractures has ranged from four months to 10 years. Twenty-five of our cases suffered no permanent disability; two are recorded as having a slight permanent loss of wrist function; there was a 10 per cent loss of wrist function in two cases, 15 per cent loss in one, and a 35 per cent loss in one. Permanent disability has not been estimated on inability to perform the duties of their usual occupation, but on pain, periarticular thickening, and restricted wrist motion. With two exceptions, the one who had a 15 per cent and the one who had a 35 per cent permanent disability, all were able to work at their usual occupations. In the one who suffered a 15 per cent loss of wrist function, his inability to continue as a miner was the result of associated injuries. The case in which there was the greatest disability (35 per cent) was the one in which the same wrist was twice reinjured and received a total of 236 days treatment for the initial and two subsequent injuries. However, in spite of the estimated disability in his case, immediately after he received his release, he applied to one of our mine officers for work as a miner.

X-ray examination of healed carpal fractures usually reveals fibrous union in the scaphoid bone; we have seen only one scaphoid fracture in which we thought there might have been bony union. In two comminuted fractures of the cuneiform, there was firm bony union.

Conclusion: The usual unfavorable prognosis in carpal fractures is undeserved. If early recognised and appropriate conservative treatment is carried out, few carpals will require operation. Reinjured carpal fractures are decidedly more disabling than are initial lesions. Good function is compatable with fibrous union of carpal fractures.

Case Number	Sex	Age	—CAUSE— Direct Violence	Transmitted Force	——BONE FRACTURED—— Scaphoid (Navicular)	Cuneiform (Triangular)	Semilunar (Lunate)	Os Magnum (Capitate)	Uniform (Hamate)	Pisiform (Os Pisiforme)	Associated Wrist Fractures	Other Associated Fractures	Temporary Disability No. Days	Permanent Disability Based on Loss of Wrist Function	Follow up Period
1	M	26	—	X	R	—	—	—	—	—	—	—	29	None	3 Years
2	M	42	X	—	—	—	—	—	—	L	—	X	38	None	2 Years
3	M	30	—	X	—	—	R	—	—	—	—	—	19	None	6 Years
4	M	33	X	—	—	—	—	L	L	—	—	X	97	None	3 Years
5	M	22	X	—	—	—	—	R	R	—	X	—	107	None	6 Years
6	M	29	—	X	R	—	—	—	—	—	—	—	31	None	4 Years
7	M	24	—	X	R	—	—	—	—	—	X	—	65	None	1 Year
8	M	28	—	X	L	—	—	—	—	—	—	X	42	None	8 Months
9	M	26	X	—	L	L	—	—	—	—	X	X	104	10%	5 Months
10	M	35	—	X	L	—	—	—	—	—	X	—	46	None	9 Months
11	M	28	X	—	L	—	—	—	—	—	—	X	37	None	6 Months
12	M	26	—	X	L	—	—	—	—	—	X	—	46	None	9 Months
13	M	22	—	X	—	—	R	—	—	—	—	—	45	None	2 Years
14	M	15	X	—	—	R	—	—	—	—	X	X	125	None	10 Years
15	M	29	X	—	R	—	—	—	—	—	X	X	93	None	4 Years
16	M	37	X	—	—	R	—	—	—	—	X	X	316	15%	12 Months
17	M	33	—	X	—	—	L	—	—	—	—	Untreated		None	4 Years
18	M	25	—	X	R	—	—	—	—	—	—	—	31	None	8 Years
19	M	28	X	—	—	—	—	—	—	L	—	Untreated		None	4 Months
20	M	37	—	X	R	—	—	—	—	—	—	—	37	None	3 Years
21	M	21	—	X	L	—	—	—	—	—	X	—	112	10%	18 Months
22	M	44	—	X	L	—	—	—	—	—	—	—	29	None	4 Years
23	M	39	X	—	R	—	—	—	—	—	X	—	125	Slight	7 Years
24	M	42	—	X	L	—	—	—	—	—	—	—	23	None	8 Months
25	M	34	X	—	L	—	—	—	—	—	X	X	135	Slight	1 Year
26	M	28	—	X	L	—	—	—	—	—	—	X	28	None	1 Year
27	M	34	X	—	R	—	—	—	—	—	X	X	635	None	5 Years
28	M	26	X	—	—	R	—	—	—	—	X	—	36	None	1 Year
29	F	10	—	X	L	—	—	—	—	—	X	—	51	None	2 Years
30	M	22	—	X	R			Reinjured				—	55	None	4 Years
31	M	32	—	X	L			Twice Injured				—	42	35%	4 Years

DISCUSSION

C. E. YOUNT: I am firmly convinced that the profession, or that part of it practicing traumatic surgery, has not as a whole grasped the importance of carpal injuries.

Carpal bone fractures with good position of fragments require at least six to eight weeks support, but, as Cotton puts it, "This extra discomfort and loss of time . . . . is yet so new a method of handling that we are going to find many doctors accessories to the failure of union . . . . and successful accessories—for years to come."

The matter of correct diagnosis is paramount. I was privileged to attend the Massachusetts General Hospital fracture course in 1929. At that time we were advised that in carpal scaphoid fractures in case of negative x-ray to repeat the x-ray in the lateral position. Furthermore, it is often found after three weeks that a fracture line will be seen which did not appear in the original x-ray. These "sprains" should be immobilized and then re-x-rayed in two to three weeks. Wilson and Cochrane says: "The more so-called sprains of wrist are subjected to critical roentgenological study the greater is the number of true bone lesions which are found. A fracture of the carpal scaphoid means a period of at least three months disability in a working man."

Kay and Cornwall say: "Many of the permanent disabilities at the wrist are the result of an erroneous diagnosis of sprain when the patient was really suffering from some more severe carpal injury."

Gordon Murray of Toronto, wrote in February of this year: "When a patient complains of a sprained wrist, with symptoms lasting more than two weeks, the possibility of a fracture of the carpal scaphoid should be considered and the necessary investigation undertaken."

Jones and Lovett wrote: "If an x-ray photograph is taken of any sprained wrist it will be found that a very large number of them are really cases of fracture of some bones of the carpus or a styloid process and not merely the injury of a ligament."

Pathology: D. B. Phemister, Brunschwic and Day. J.A.M.A. Vol. 95, October 4, 1930, page 995) describe "Kienboch's Disease, Traumatic Osteoprorosis—carpal lunate." One case is cited. A rentgenogram revealed slight reduction in density of the central ulnar portions of the bone. A lateral view revealed flattening of the lunatum most marked dorsally. The specimen removed at operation showed the larger dorsal fragment was flattened and contained a small cavity filled with dark gray fleshy material. The Palmer fragment consisted of dense bone; cultures gave long chain streptococcus.

As I interpret this sympsoium, it is Dr. Palmer's purpose to create a deeper interest in and a most careful scrutiny and proper care of all carpal injuries in Arizona in the future. Should these objectives be attained, in years to come we will have to look back on these essayists as pioneers in a new field of fracture work.

DR. DUNCAN: Fracture work should become a specialty. This state is slow in recognizing this. A man can be a good general surgeon and not be an especially clever fracture man. It seems to me that this work should be taken out of the hands of the general practitioner. It might well be a function of this society to make a survey of the profession of the state and list those who are willing to do this work. In smaller localities the doctor should be schooled in initial steps necessary before sending the cases to specialists. It might well be the work of our Industrial Commission to aid in bringing this about for it seems of great importance.

DR. SWACKHAMER: I express my appreciation for this excellent symposium. I stress the need for early diagnosis, and call attention to the fact that some authorities recommend three routine pictures of these injuries. We can not be too thorough in this type of diagnosis.

DR. E. PAYNE PALMER: In the cases of delayed union or of non-union in carpal injuries the treatments used in other parts are applicable. Going in and cleaning up the ends of bones, getting the blood flow, carrying out the use of casts as outlined by Dr. Greer, are all necessary and important. The warning I sound is—not to be in too big a hurry to get these patients to use the hands.

DR. YOUNT (concluding his discussion): This program has been a real triumph for the Industrial Commission. Dr. Palmer has focused our attention that our results might be improved. Dr. Watts' statistics and findings on the 31 cases are extremely enlightening and beneficial. Dr. Greer's point that he did not care to operate all these cases is well taken. Such conservatism is to be commended. The various suggestions and demonstrations relative to the use of the x-ray will be of help to all of us; the findings are often astounding.

DR. R. F. PALMER (concluding): I express our appreciation to Dr. Watts for delving into 8 years of histories. The Miami-Inspiration hospital has some marvelous work to its credit. They are in the position to give early treatment and have men on the job constantly. Often these cases are not gotten early enough. The Industrial Commission is greatly concerned financially with the cases. The larger company with its own staff of surgeons does not afford the Industrial Commission a problem as does the smaller concern with no staff of surgeons. I greatly appreciate Dr. Yount's compliments of the Commission. Dr. Greer's conservatism is to be commended. From the Commission's stand point the functional use of the hand is of utmost importance. This use must not be forced too soon if the case is to be settled with physical and financial satisfaction to the patient and the Commission. I wish to express the sincere appreciation of the Commission to Dr. E. Payne Palmer for his year round splendid cooperation.

DR. WATTS (concluding): Dr. Yount has given us a most excellent as well as complimentary discussion. He has added much that is much worth while. Dr. Swackhamer's demonstration of routine pictures is not to be forgotten after the moment. I feel more than repaid for the time spent in research on the 31 cases. Your attention and consideration have been most gratifying.

DR. GREER (concluding): I wish merely to say thank you for a most profitable afternoon's discussion and symposium.

MODERN TREATMENT OF FRACTURES—by H. Waldo Spiers, A.B., M.D., Professor of Orthopaedic and Fracture Surgery, College of Medical Evangelists, Los Angeles, California. Published by William Wood and Company. Price, $2.00.

Modern Treatment of Fractures is in reality a primer on the treatment of fractures giving the fundamentals of bone surgery, touching the high spots in practical application. It is especially useful for the man who has not had an extensive experience in fracture work.

RELATIONSHIP BETWEEN THE ARIZONA INDUSTRIAL COMMISSION AND ARIZONA MEDICAL PROFESSION

LEO GUYNN

(Manager Claims Department of The Arizona Industrial Commission).
Phoenix, Arizona.

Any discussion or paper dealing with the subject of the relationships existing between the members of the medical profession, particularly those practicing industrial surgery in this state, and the Industrial Commission should be prefaced with a few brief remarks describing first, what actually constitutes the relationships between our two respective organizations, and second, the predominating factors which exert both a guiding and a restrictive influence upon our relationships.

Strange as it may seem, our relationships are born out of human suffering—a workman in the course of his employment must be injured and disabled before we are ever brought together. Once an injury has been sustained, however, we must rise together and apply the full force of our combined effort and ability to bring about the physical restoration of the injured workman, and his speedy return to the ranks of industry. Truly, this field presents an opportunity for unified effort and cooperative action which should instill in every one of us a desire to put forth the best we have in us. It develops, therefore, that our relationships are in reality our actions from day to day as we strive to solve the mutual problems confronting us. With such a background our relations should indeed be a source of keen pleasure to all of us.

Now, with regard to the predominating factors having such an important influence upon the nature and character of our relationship: First, there is the legal factor, or the guiding influence exerted upon our relationships by the statutory and common law, and by the judicial precedents and court decisions, which have been handed down as a guide to those charged with the responsibility of administering the Workmen's Compensation Law.

Second, we have the human factor, or the influence exerted upon our relationships by such commendable human traits as the spirit of self-sacrifice which causes us to place service above self, and to submerge our own personal interests where they are in conflict with the welfare of the common cause. And unfortunately, we are frequently compelled to combat disrupting influences such as selfishness and other weaknesses—and right here let me say that the Commission does not for one minute believe that the virtues are all ours, and the sins are all chargeable to the medical profession.

Finally, there is a factor which has, during the year, had a most beneficial and far-reaching effect upon our relationships. I refer to the Industrial Relations Committee of the Arizona State Medical Society.

Now, to explain more fully the influence exerted upon our relationships by the factors heretofore mentioned, we will return to the legal influence, which I can assure you is of extreme importance, and which cannot be too strongly emphasized. The Industrial Commission of Arizona was created by the people of the state in 1925, through the enactment of a Workmen's Compensation Law. The law not only sets up the qualifications required of the Commissioners and provides for their appointments, but goes further and very definitely regulates their conduct in office, and their administration of the law. Certain legal safeguards have been thrown up to assure the injured workman his day in court, with an opportunity to present his case before the Commission. Certain legal mandates compel the Commission to exhaust every known device to the end that the true facts may be developed in each case and a fair and equitable decision rendered.

No doubt many of you have frequently felt aggrieved at our insistence that you set down in terms of percentage your estimate of the permanent disability existing in some case which you have recently discharged from treatment. There is a definite reason why we must have your estimate in percentage. Our Supreme Court has ruled that our awards of Supreme Court has ruled that our awards must be based on a careful consideration the effect that a claimant for compensation has suffered a permanent disability equal to 25 per

cent loss of function of the right leg and compensation is awarded on that basis, then to justify our findings and award we must have evidence on file showing conclusively that there is a disability equal to 25 per cent loss of function of the right leg. It is possible that we may have another report estimating the disability at 50 per cent loss of function of the right leg, in which event we could find the disability to be either 25 per cent of the leg or 50 per cent of the leg and award compensation for either amount, and our award would be sustained. On the other hand, if the Commission attempted to strike an average and award compensation on the basis of 37½ per cent of the leg, or any other percentage of disability other than that reported, then our findings and award would be set aside by the Supreme Court, because the evidence would not sustain the findings of the Commission.

We know, too, that many of you have been subjected to considerable inconvenience, when you have been subpoenaed to testify at hearings before the Commission. You may rightfully say that you have submitted your honest opinion in the form of a written report, which should be sufficient and thereby obviate the necessity of your being present in person and giving testimony under oath. Decisions by our Supreme Court, however, will not permit the Commission to consider a medical report in a contested case, where any party at interest has been denied the privilege of cross-examining any physician or surgeon who may have examined the injured man and reported upon his condition.

I could go on at considerable length discussing the legal factor as it affects our relationships. However, I know that you will realize from my remarks on this subject that our course is definitely plotted for us in advance, and in the future when a request comes to you asking for a more definite and complete report, or when you are served with a subpoena commanding you to be present and give testimony at a hearing, we hope you will realize that the Commission is not trying to make your life miserable or asking for a lot of unnecessary red tape, but that we are trying earnestly and sincerely to meet the legal responsibilities which the Workmen's Compensation Law has placed upon us.

Now, for a few words relative to the influence exerted upon our relationships by the different human emotions, personality, or the lack of it, character and all of the things which go to make up the disposition of each of us as individuals. Because of the good which would come to those of us associated with the Industrial Commission, we had hoped that a paper dealing with the subject that I have been delegated to cover, would be prepared and delivered by some member of your group. In that way we hoped to have our shortcomings laid before us in order that we would see them as others see them, and in order that we could be given the opportunity to make good our boast that we stand ready at all times to set our own house in order.

The greatest obstacle we have to surmount is our unwillingness to take into account each other's point of view, and our failure to realize that both the industrial surgeon and the Industrial Commission have a definite and important role to play in the scheme of events which bring us together.

I know sometimes you are thoroughly disgusted with the whole field of industrial injury work, when you learn per chance that one of your patients has been referred to another physician for an examination, or when you are told that a patient you have had under treatment, and are still reporting as disabled, is dropped from the compensation rolls by the Commission, on the basis of a report submitted by our medical referee or some examining surgeon designated by us. I know too, that you are oftentimes brought right up to the boiling point, and occasionally some of you boil completely over, when we take some action which is especially distasteful to you in connection with the payment of your bills. All of the situations which you frequently find distasteful might be avoided if the Commission gave a little more consideration to your point of view.

We too experience a sudden rise in temperature when we learn for the first time that a certain favored patient has been kept in a private room for six weeks and allowed the services of a special nurse, while other industrial cases are fighting it out in a ward. All of this, in spite of the definite stipulation in our medical and surgical fee schedule that these accommodations may not be provided for a

period longer than seven days without being authorized by the Commission. Frequently we learn too late that some physician has purchasde, at the expense of the Commission, some expensive brace or appliance, or has run up a large bill for laboratory or dental work, all without authorization and in spite of the fact that we might have procured the same items or service at a considerable saving. We might even have vetoed the expenditure in its entirety. These situations and many others could be avoided if the medical profession would give a little more consideration to the Commission's point of view. Many of you are of the opinion, no doubt, that we are running the question of high medical costs and excessive fees into the ground, but on the other hand if you will stop to realize that when the Commission engages your services in an industrial case, thereby delegating to you practically unlimited authority to pledge our credit for hospital accommodations, nursing services, drugs, etc., we are virtually handing you our pocketbook with the money uncounted. Our only request is that you keep expenditures at a point consistent with good treatment. Our only protection is your willingness to take into account our problems.

In closing, I shall say a few words about the benefit that has been had and the ground that has been gained through the efforts of your Industrial Relations Committee. When your committee first came together around the conference table with the members of the Industrial Commission, the problems to be solved and the results which we hoped to accomplish were obscure and somewhat doubtful. There was a certain amount of uncertainty as to the nature and scope of the activities to be covered by your committee and the Commission. It was not long, however, before the Commission realized that the members of the Arizona State Medical Society, in their relationships with the Industrial Commission, were represented by a committee of fair, broadminded, farsighted men, all willing to go to unusual extremes in their efforts to give to the Commission the benefit of their knowledge, to promote harmony, and to place the relationships arising out of our daily contacts upon a more straightforward, businesslike and unified basis. Complaints which certain members of the medical profession had to make against the Industrial Commission were referred to the committee, and on one or two occasions the Commission also looked to the committee for relief and guidance in a situation where we felt that we were being treated unfairly. In every instance your Industrial Relations Committee painstakingly listened to both sides of the story and decided honestly and to the best of their ability the questions submitted to them. No better proof of the esteem and respect with which your committee is regarded can be offered than the fact that not once has their decision been questioned or disregarded. They have come to us frankly with constructive criticism and suggestions as to how our service to the medical profession might be improved. They have responded admirably to our requests for assistance and advice. On behalf of the Commission, I would say that we sincerely hope that you may see fit to continue your activities intended to bring about a better understanding of our mutual problems through a continuation of the efforts of your Industrial Relations Committee, and through the individual efforts of every member of your honorable profession.

INDICATIONS FOR SURGICAL TREATMENT OF PEPTIC ULCER

FRED R. HARPER, M.D.
Thomas-Davis Clinic, Tucson, Arizona

Surgery holds an important place in the treatment in certain types of peptic ulcer, while medical treatment is definitely indicated in others. The successful handling of a large number of cases of peptic ulcer will depend upon the careful selection of cases for the type of therapy indicated.

Medical management is useful in both gastric and duodenal ulcers. Small uncomplicated gastric ulcers will often respond readily to medical treatment. However, unless a rapid response is obtained, surgery is indicated because of the danger of malignancy. Gastric ulcers larger than a 25 cent piece ordinarily should not be treated medically; medical treatment should show definite improvement within three weeks.

In duodenal ulcers, the problem is somewhat different inasmuch as the danger of malignancy is remote. Uncomplicated duodenal ulcers, especially in young persons with short histories of ulcer, should be treated medically as a rule for one year. If the ulcers have not definitely responded to conscientious medical treatment at the end of that time, surgery should be considered. In accepting a patient for a thorough course of medical therapy certain factors important. He must be co-operative and intelligent; his finances must be adequate to carry on a long course of treatment; and the occupation to which he will eventually return, must be of such a nature that it will not exact too great mental or physical strain.

Certain complicated cases of peptic ulcer ordinarily delegated to surgery, are better treated medically because of such extrinsic factors as cardio-vascular-renal disease, senility, diabetes and pregnancy.

The cases which should come to surgery are: Those who have been given a fair trial of medical treatment with failure; those who, because of occupation, social status or other reasons stated above, have not been accepted for medical treatment (in this group might be placed almost all railroad men whose hours of work and habits of eating are notoriously irregular); and the final large group of complicated cases.

The common complications of duodenal ulcer are: Perforations, obstructions, hemorrhage and those in whom malignancy can not be ruled out. Acute perforation is always a surgical emergency; any perforating lesion responds poorly to medical management and is best treated surgically.

Chronic obstruction arising in association with gastric or duodenal ulcer is a primary indication for surgical intervention. It has long been recognized that there are few surgical procedures that give better results than are obtained following pyloric obstruction. I recently reported a case of duodenal ulcer with obstruction which was neglected for nine months. When the patient finally came to surgery, an additional large ulcer of the lesser curvature of the stomach was found.

Hemorrhage, per se, is not necessarily an indication for surgical intervention and operation does not offer complete protection against recurring hemorrhage. **Balfour** reports nine per cent of recurrent hemorrhages in a series of 500 cases. Surgery is only adequate if it removes bleeding points. A single hemorrhage is, therefore, not an indication for surgery. Hinton feels that conservative management is by far the better method of treatment and an operation is never indicated except in repeated hemorrhages. When, however, hemorrhages recur in spite of active medical management, surgery is indicated. Operation is probably never indicated during active bleeding. In hemorrhaging ulcers medical treatment and bed rest for 10 days prior to operation, are insurance that an operation will be helpful. Fowler and Hurevitz say that, although it is usually considered inadvisable to transfuse an ulcer patient who is still bleeding because of the likelihood of increasing the hemorrhage, they have not so found in their group of cases. Removal of the lesions is important and cases which have recurrent hemorrhages following surgery in which the lesion is not removed, present distressing problems.

Gastro-enterostomy is probably the most dependable and widely used operation in the treatment of peptic ulcer. The present refinements of the posterior gastro-enterostomy make the operation relatively safe and simple.

Many authors have condemned gastro-enterostomy in the treatment of gastric ulcers. In small gastric ulcers along the lesser curvature, however, cautery excision, together with gastro-enterostomy, has given satisfactory relief in 90 per cent of the cases. Also, in large gastric ulcers along the lesser curvature which are sufficiently removed from the pylorus to make partial gastrectomy difficult, it is best to combine knife or cautery removal with gastro-enterostomy.

Gastro-enterostomy has its main field of usefulness in the treatment of chronic ulcers of the duodenum. Gamble states that gastro-enterostomy is indicated in all cases of ulcer of the duodenum, except the easily accessible ones which are amenable to excision and pyloroplasty, or the bleeding ulcers and the acutely perforating ulcers in which it may or may not be combined with simple closure of the perforation. Balfour says that at the present time there is no conclusive evidence that any operation is more useful than gastro-enterostomy in cases of chronic duodenal ulcer, except in carefully selected cases. The operation is

not destructive and can be depended upon to give excellent and permanent results in more than 90 per cent of cases. It also has the distinct advantage over all other operations in that, after the ulcer has completely healed, the anastamosis may be disconnected with ease and safety, if desired. The danger of anastomotic ulcers following gastro-enterostomy are well recognized. Ogilvie puts the incidence as high as 20 per cent, while Heuer obtained data from 17 authors and found the average incidence to be only three per cent.

Authorities are more or less agreed that gastro-enterostomy is the procedure of choice when the ulcer is of long standing and there is definite pyloric stenosis.

In this country, the main contention in the surgical treatment of duodenal ulcers has been on the advantages of pyloroplasty over gastro-enterostomy. Various types of pyloroplasty have been described by Ramstead, Finney, Robson, Horsley, Strauss, Judd, Deaver and others. Most of these operations combine excision of the ulcer with enlargement of the pyloric outlet. As a rule, the less the pathology in the duodenum, the greater is the indications for pyloroplasty. Judd estimated that pyloroplasty can be carried out satisfactorily in about 50 per cent of all duodenal ulcers. In order to do a satisfactory pyloroplasty, the lesion must be relatively small and the duodenum must be freely movable and readily accessible. The indications for pyloroplasty might be summed up as follows: If there is slight stenosis of the pylorus; if the ulcer can be excised; if there is a history of repeated bleeding of the duodenal ulcer; if the ulcers are small; if there are few adhesions; if the duodenum is easily mobilized; if there is absence of inflammation around the duodenum; if there is a single ulcer; and in some cases in which gastro-enterostomy has failed.

In general, it might be said that pyloroplasty is a good operation in young individuals in whom medical management has failed and in whom the ulcer is of relative short duration without a great deal of retention and, provided that it can be performed without technical difficulty.

Many of the European clinics, particularly in Germany as well as several clinics in this country, use gastric resection as the operation of choice in dealing with peptic ulcer. Ogilvie believes that, because of the high incidence of gastrojejunal ulceration following gastrojejunostomy, the mortality is lower and the results more satisfactory following gastrectomy. Walters investigated this subject and found that the ulcers in Germany were of a much more extensive nature and usually accompanied by severe gastritis and duodenitis, which probably explains the enthusiasm of the European surgeons for gastrectomy. Many surgeons have favored gastrectomy because they felt that extensive removal of the fundus of the stomach, together with the antrum, would decrease the acid secreting powers of the stomach and thus prevent future recurrences. Emery and Monroe believe that a radical operation on the stomach, which removes the antrum, removes the part of the stomach which has an alkaline secretion and should be abandoned. I demonstrated experimentally on dogs that the secretion from the pyloric antrum was protective and did not contribute to the formation of peptic ulcer. I believe, therefore, that resection is not justified as a routine procedure for peptic ulcer. There are definite indications for accepting the added risk of a gastric resection: When large gastric ulcers, particularly in the pyloric portion of the stomach, are present; in cases in which the ulcer is accompanied by extensive duodenitis and gastritis; in cases where a repeated history of bleeding, would seem to justify radical measures; as a secondary operation, when gastro-enterostomy or pyloroplasty have failed, and in all cases of gastric ulcer where malignancy cannot be definitely excluded.

CONCLUSIONS

Cases of peptic ulcer should be carefully selected before deciding on a medical or surgical course of treatment. In selecting the patients, their age, social status and the duration of their disease as well as the probable pathology, should be considered. If surgical treatment has been chosen, some form of one of the general procedures, gastro-enterostomy, pyloroplasty or gastric resection, should be chosen, depending upon the pathology present. In many cases, the decision as to the type of surgical procedure must be made at the operating table.

BIBLIOGRAPHY

1. Balfour, D. C.: Results of Gastro-enterostomy. Trans. Amer. Surg. Assn. 48: 146-150, 1930.
2. Emery, E. S., Jr., and Monroe, R. T.: Peptic

Ulcer: Nature and Treatment based on a Study of 1435 cases. Arch. Int. Med. 55: 271, 1935.
3. Fowler, W. M., and Hurevitz, H. M.: Bleeding Peptic Ulcer. Jour. Iowa State Med. Soc. 25: 115-118 March 1935.
4. Gamble, H. A.: Surgical Indications and End-Results of Operation for Duodenal Ulcer. South. Med. Jour. 21: 844-847 Oct. '28.
5. Harper, F. R.: Development and Treatment of Peptic Ulcer: An Experimental Study. Arch. Surg., 30: 394-404 March 1935.
6. Harper, F. R.: Gastric Ulcer Following Duodenal Ulcer with Obstruction: Report of a Case. Amer. Jour. Digest. Dis. and Nutr. 2:271-274 June 1935.
7. Heuer, G. J.: The Choice of Operations in the Treatment of Peptic Ulcer. N. Y. State Jour. of Med. 35: 1-9 Jan. 1935.
8. Hinton, J. W.: Massive Hemorrhage in Peptic Ulcer. Ann. Surg. 101: 856-862 March 1935.
9. Judd, E. S.: Peptic Ulcer—Surgical Therapy. Jour. Mich. State Med. Soc. 30: 409-412 June 1931.
10. Ogilvie, W. H.: The Place of Surgery in the Treatment of Peptic Ulcer. Lancet, 228: 419, 1935.
11. Walters, W.: The Choice of Surgical Procedures for Duodenal Ulcer. Ann. Surg. 96:258-268 August 1932.

MEDICAL ANNALS OF ARIZONA

By ORVILLE HARRY BROWN, M. D.
Phoenix, Arizona

PREFACE

The medical annals of Arizona have been gathered in fragments from numerous and widely separated sources. Among those who have been of assistance are the authors of the various books concerning this state and her citizens; first among those to be mentioned is the late Col. James E. McClintock, valued friend and patient, who so loved Arizona that he devoted much of his time and fortune toward preserving facts about her citizens and visitors. To have known him was a great privilege; from him came much information and stimulation for the task. His biographical volume along with those of Stone, Farrish and others have furnished sketches of the lives of many physicians of the present and recent generations.

The earliest physicians had no biographers. Their records must be gathered piecemeal from the silent files of old newspapers, from musty historical volumes, from invaluable historical novels and from vari-colored personal communications penned and verbally related by the living and then pieced and woven together the best possible in none too satisfactory a manner.

We have enjoyed many fruitful friendships which have yielded valuable data for our annals, acquired much stimulus and many facts from various men and women now living, all of whom have been interested in preserving Arizona history; we delight in mentioning several, especially Sharlot Hall, Will Barnes, Dean Frank Lockwood, Dean John R. Murdock, present State Historian Elizabeth Touey, Judge Henry D. Ross, and last but certainly not the least, James M. Barney. The earlier chapters could not have been written with the completeness they exhibit except for the magnificent assistance of James Barney.

There are those members who have provided information essential to the bridging of the past generation with the present; among these are Drs. James E. Drane, John E. Bacon, E. Payne Palmer, John W. Flinn, Geo. M. Brockway, Win Wylie, E. S. Miller, and especially L. A. W. Burtch and Wm. V. Whitmore.

It is a great pleasure to publicly acknowledge gratitude to those herein mentioned and to all others who have given or will yet provide assistance in this undertaking.

CHAPTER 1
EARLY MEDICAL PRACTICE IN THE SOUTHWEST

THE INDIAN MEDICINE MAN

The Indian medicine man was the first exponent of the healing art in Arizona. Every Indian tribe had its coterie of medicine men who were generally individuals of great influence within tribal circles. Although, in a general way, they practiced their art along similar basic lines, individually, they differed in their methods of curing the sick. Most of their healing was based upon the faith of the patient in the efficacy of incantation efforts and necromancy rather than upon medical lore.

Medicine men were believed by their tribesmen to possess certain influences over the spirits and other natural phenomena which supposedly caused sickness and disease, as well as over the benevolent spiritualistic agencies which could assist them in amelioration or cure. Incantation and jugglery were invariably practiced by them in their efforts to drive from the sick persons, the evil spirits or influences that were causing the bodily disturbances.

Terrifying noises were generally a part of the routine cure and it was nothing unusual for a whole company around a sick person—

over whom the "doctor" was practicing his cabalistic manipulations—to arise at certain intervals, chant and pound their bodies, yell, shoot arrows into the air, and fire off guns, in order to assist the medicine man in frightening away the evil spirits which had the sufferer in their clutch. Among some tribes failure to alleviate or cure the sick meant death to the unlucky medicine man while, among others, he was merely subjected to violent abuse.

In spite of much that was absurd and ridiculous in the medicine men's practices, they generally had some understanding of surgery and anatomy, and astonishing knowledge of the value of many medicinal herbs native to the Indian country.

THE TRAIL-BLAZERS AS DOCTORS

Most of the early southwestern path-finders, hunters and trappers were not only familiar with the simple home remedies of their forefathers but they gradually acquired the knowledge the Indians possessed of the medicinal use of native herbs and plants. Serious injuries and accidents were not uncommon among the people; they were able, as a rule, to cope successfully with even severe wounds and in a crude but remarkably efficient way set broken bones.

JAMES PATTIE

The first Anglo-Saxon visitor to what is now Arizona who had any practical knowledge of medicine, was James Pattie, a trapper and hunter from the mountainous region around Bardstown, Kentucky.

James Pattie and his father, Sylvester Pattie, assembled, in the year 1824, a party of some 100 frontiersmen for a trapping expedition to the head waters of the Arkansas River. After many thrilling adventures this party disbanded; but a few of the boldest spirits remained in Nuevo Mexico where they organized, after obtaining permission from the Governor of that province, a small party to trap along the Gila River. Leaving Santa Fe on November 22, 1824, they struck out across the country, proceeding by way of the Santa Rita Copper Mines to the Gila River.

This trapping expedition lasted about five months and, as far as known, was the first organized party of whites to penetrate the Upper Gila Valley. Many of the natives having never seen a white man, fled at the approach of these adventurers but others, more bold, viciously attacked them with bows and arrows. The Pattie party, cacheing the pelts they had gathered, returned to Santa Fe for fresh supplies; upon returning to the Gila for their furs, they found that the Indians had discovered their cache and stolen the contents. Going to the Santa Rita Mines, which they had known about, they entered into a treaty of peace with the Apaches (under Mangas Coloradas—Red Sleeves) whereby they were allowed to work the mines without molestation.

The elder Pattie, familiar with the method of reducing copper ores, obtained a lease on the Santa Rita mines and commenced a profitable working of that property. While the father was thus engaged, young Pattie, in spite of his father's remonstrances, set out on January 26, 1826, with a few companions on another trapping expedition into the Gila Valley. On this trip, lasting around eight months, the party passed down the Gila to its junction with the Colorado and ascended the latter stream well past its now famous and unrivalled Grand Canyon. The immense chasm and its labyrinth of gorges with their vari-colored walls aroused no great interest among Pattie's companions who viewed them only as provoking obstacles on their journey northward. They crossed the Continental Divide at South Pass and again found themselves in the plain country where they found the great buffalo herds that roamed that region.

The Pattie party then crossed the mountains to Santa Fe where bad luck again overtook them. They had been successful in their trapping and brought back a large stock of furs, but the Governor of New Mexico, claiming that the license formerly issued to the Patties did not cover this latest expedition under James Pattie, confiscated all the pelts belonging to the party, leaving them without recompense for their many months of privations and hardships. Young Pattie then joined his father at the Santa Rita mines.

In the spring of 1827 a trusted Spanish employee of Sylvester Pattie at the mines absconded with most of the money that the elder Pattie had been able to make during several years of hard work; he was forced to abandon his mining operations. The two Patties then decided again to try their hand at trapping in

an effort to re-coup their fallen fortunes; they went to the Gila River country with a party of about 30 men.

They traveled down the Gila and, after many engagements with hostile Indians, reached the Colorado, where all their stock was stolen by the Yumas. Here the party of trappers, their ranks sadly depleted by desertions, built canoes and floated down the Colorado to its mouth at the head of the Gulf of California, where, instead of finding settlements, they encountered, on each side, nothing but bleak and desolate shores. Burying their stores and furs, they crossed the sterile Lower California peninsula, suffering enroute terrible hardships; on reaching San Diego they were imprisoned by the Mexican authorities for lack of passports.

They were held in confinement for many months; the elder Pattie died in his cell without being allowed to see his son, for whom he piteously begged in his last hours. Young Pattie was finally released from prison. Most of the other members of the party remained in California among the Mexican inhabitants and became permanent residents of the country.

After remaining in California until the spring of 1930, Pattie embarked for Mexico and went to the capital of that Republic where he put in claims for damages for the losses he had sustained; he failed to obtain redress. He then went to Vera Cruz where he obtained passage to New Orleans, from which point he ascended the Mississippi to his old Kentucky home. Some years later Pattie published a book describing his party's adventures in the wild southwestern country; this provided a valuable source of information of the regions traversed by these aggressive pioneers of that early day.

THE PATTIES' MEDICAL KNOWLEDGE

Not only was the young frontiersman Pattie familiar with the effects of the ordinary, well-known, remedies of the pioneer period but he brought westward with him small-pox vaccine and was able to and did inoculate many persons, thus preventing somewhat the ravages of that dreaded disease. He used this knowledge to advantage, not only among his own companions but perhaps also among friendly Indians and other inhabitants of the isolated regions through which his group passed.

His knowledge of vaccination against small pox along with his ability as an interpreter was largely responsible for his being released from the California prison.

An epidemic of small pox was raging and he assured the authorities of his power to check the epidemic through vaccination if he but had his freedom. On release he promptly vaccinated the inhabitants of the missions, saving many lives and checking the epidemic. His use of vaccine was probably the first scientific medicine ever practised in the state of Arizona.

BOOK REVIEWS

DISEASES OF THE LIVER, GALL BLADDER, DUCTS AND PANCREAS—by Samuel Weiss, M.D., F.A.C.P.; Chapter on Surgery by J. Prescott Grant, M.D., F.A.C.S.; Chapter on Roentgenology by A. Judson Quimby, M.D., F.A.C.R.; Paul B. Hoeber, Inc.; $10.00.

The statement that there are 1100 pages of a book 7½ by 10½ inches devoted to the liver, gall bladder, ducts and pancreas, would seem to be proof that the author had made an extensive study of his subject. The volume is essentially a treatment of the every-day problems connected with the diseases of the organs in question. An exhaustive survey of the literature is presented. The illustrations are simple but adequate and very much to the point. There are 358 illustrations. There are 31 chapters and an appendix; 17 pages are devoted to the list of biliary tract diseases; 37 to anatomy; 27 to physiology; 38 to abnormalities; 22 to the examination of the liver and gall bladder; 60 to indirect examination of the liver in which it would seem that every known test is described. Other subjects dealt with are: portal hypertension, cirrhosis, tumors, cysts, tuberculosis, syphilis, jaundice, etc. The volume is a splendid reference work.

The publisher has done a beautiful job. The type is easily read, the pictures are clear, and it would seem that the book is one that will live indefinitely.

THE PRINCIPLES AND PRACTICE OF UROLOGY: by Frank Hinman, A.B., Leland Stanford Junior University, M. D. Johns Hopkins Medical School; Clinical Professor of Urology at the University of California Medical School.

Dr. Hinman's text on urology is a well written and readable manuscript. He covers the biological principles of urology in a comprehensive and extensive survey of the comparative anatomy of the genito-urinary tract, with a thorough study of the embryology and development of the various organs. He clearly demonstrates how the common abnormalities are apt to occur. In the clinical portion of the book he covers the ordinary principles of examination and demonstrates by numerous diagrams, photomicrographs, and pictures the various diseases and abnormalities that can be demonstrated. He covers thoroughly the method of diagnosing any given urological condition, in a clearly written and detailed manner.

Dr. Hinman's book is a valuable contribution to medical literature, as it is not only an excellent book for the medical student, but it is also an excellent reference book for all men in the medical profession, whether they are urologists, or general practitioners. He is to be commended for his excellent book. —J.W.P.

Southwestern Medicine

Printed by THE A. C. TAYLOR PRINTING CO., Phoenix, Arizona
Published monthly for the Board of Managers of the four constituent societies.

VOL. XIX. OCTOBER, 1935 No. 10

EDITORIAL STAFF

ORVILLE HARRY BROWN, M D., Phoenix, Arizona — Editor-in-Chief
CHESTER AWE, M D., El Paso, Texas — Associate Editor
W. WARNER WATKINS, M D., Phoenix, Arizona — Associate Editor
L. B. COHENOUR, M. D., Albuquerque, N M. — Associate Editor

BOARD OF MANAGERS
ARIZONA STATE MEDICAL ASSOCIATION

D. F. HARBRIDGE, M. D. — Phoenix
C. R. K. SWETNAM, M. D. — Prescott

EL PASO COUNTY MEDICAL SOCIETY

DR. PAUL GALLAGHER — El Paso
W. L. BROWN, M. D. — El Paso

NEW MEXICO STATE MEDICAL SOCIETY

C H. GELLENTHIEN, M. D. — Valmore
J. ROSSLYN EARP, M. D. — Santa Fe

MEDICAL & SURGICAL ASSOCIATION OF THE SOUTHWEST

C. R. SWACKHAMER, M. D. — Superior, Ariz.
J G. MOIR, M. D. — Deming, N. M.

MEDICAL ANNALS OF ARIZONA

We are pleased to publish the first chapter of "The Medical Annals of Arizona." The material accumulated seems to warrant this beginning. We are the self appointed Arizona Medical Historian. It has been a lot of fun—to do the necessary reading. Purposeful reading is truly a great joy. We refer especially to purposeful relaxation reading. Of course every physician who is really trying to deserve his title gets his keenest joy from his purposeful medical lore reading along the lines of his greatest interest. The true physician would certainly be given his greatest punishment and anguish were he denied access to modern publications and sources of information on the advancements in scientific medicine (including, of course, our friends the really educated honest "detail men").

The material in the files of the Arizona Medical Historian is already voluminous — thanks to many persons. We have repeatedly asked each living Arizona physician to supply information to these files about at least one physician—the physician he knows the best. A considerable number of the physicians have complied with the request. Others have not. **Arizona Physicians!** If you have not supplied the historian's office the data about the physician whom no other physician knows so well as you know him DO IT NOW. It should be unnecessary to say more along this line in order to have co-operation from all Arizona physicians. A thumb nail sketch of the entire life of each Arizona physician is desired.

Information about other physicians than the one you best know will be gladly received and it is really your duty to supply these data. It is even more difficult to gather facts of some of the modern physicians than of many of the early physicians. Perhaps an occasional early Arizona physician has gone to his reward leaving no record of his Arizona existence. For the most part physicians are generally of an importance to at some time or another attract the nose of the news-hound. The old newspaper files have yielded our greatest supply of information. The historical novels and biographical volumes afford much data. Many a novel has been read to get a few short paragraphs from each about the objects of our search. The stories were good for tired nerves and brain even without the thrill of discovered nuggets for which search was being made. Certain physicians have been mentioned in the preface in anticipation of what they shall do. We hope to be able to mention many others. We do need help. May the publication of these chapters stimulate other portions of our territory to preserve their medical history data.

Medical Annals of New Mexico

Some New Mexico physician is losing the opportunity of a life time. A medical historian can not be elected. That is not true! A medical society can elect a medical historian and certainly they should do so if they could be fortuate enough in his election. The best way perhaps is to call for volunteers. We should like to hear from a New Mexico physician who wishes to get real pleasure from non-medical reading and at the same time be doing a worthwhile deed for posterity. We will then inaugurate a campaign to have the physicians of the two states do what the Arizona physicians have been asked to do in the above editorial.

Early Medical Annals of El Paso County

For the editorial which we would have you

read under this caption read the preceding editorial substituting the words 'El Paso' for the words 'New Mexico' and add in the line next to the last after the word states the words 'and El Paso County.'

These are meritorious ambitions. We shall be glad to tell the historians of these two places how we have accomplished what we have.

INTEGRATION OF THE MEDICAL PROFESSION

The Medical Society of New Jersey has legally incorporated giving the society a legal standing, making it a corporate body like a bank or business corporation whose members cannot be held individually liable for its officials, officers, and managers. Under this process of integration every physician by virtue of his status as a licensed practitioner becomes automatically a member of the corporation. It is empowered to supervise professional activities of all licensed physicians and to administer such discipline as thought desirable. Expulsion from the corporation automatically revokes one's license.

Such an organization is in reality a guild. The one disadvantage is that it has no right to pick and choose its members, taking only those who are morally and professionally qualified. The corporation would take over the licensing of practitioners seeking admission to practice in the state. Since the corporation would assess the members for the necessary funds with which to operate it would mean that the State Medical Association would be a duplicate tax upon the physician or the corporation would supplant the State Medical Association. The assertion has been made that there would be a disadvantage to this program as the average member of the corporation would not have the same high professional, ethical, and scientific standards in the corporation as the average previously had been in the State Medical Association. It has also been stated that the next move would be for the osteopaths, chiropractors, naturopaths, and other cultists to incorporate thus producing a multiplicity of corporations with no centralization.

Had such a corporation been conceived before the advent of the cultists and had it been for the purpose of the control of the healing art rather than the so-called "practice of medicine" which is in reality the same thing but which is now looked upon as two separate propositions there would have been splendid opportunity to have controlled quackery.

In a state which has the Basic Science Law perhaps there is not the same need for such a corporation as in the states without the Basic Science Law.

THE AMERICAN PUBLIC HEALTH ASSOCIATION CONVENTION

From August 7 to 10th, Milwaukee will be the center for the Public Health Officials of the United States. Along with the American Public Health Convention will meet the Association of Dairy, Food, and Drug Officials, American Association of School Physicians, Association of Women in Public Health, Conference of State Sanitary Engineers, Conference of State Laboratory Directors, Conference of Wisconsin Health Officers, State Registration Executives and State Directors of Public Health Nursing, International Society of Medical Officers of Health, and National Committee of Health Council Executives.

About 400 papers will be presented dealing with such subjects as mental hygiene, diphtheria and scarlet fever immunization, poison in food, public sanitation, treatment of sewage and polluted waterways, public health engineering, planned milk control, laboratory studies of toxins and vaccines, tuberculosis, milk-borne disease, water purification, etc.

It is hoped that members of the medical profession will attend the convention in great numbers.

ANOTHER CITY ADOPTS THE SAN DIEGO PLAN

Omaha, Nebraska has organized a Central Health Service providing for necessary medical care to the low income group somewhat along the line of the San Diego Plan. The Board of Directors is constituted of three physicians, two dentists, one hospital superintendent, one nurse, and one pharmacist. There is a full-time executive secretary and one field worker with the necessary clerks and head officers.

They have deviated slightly from the San Diego Plan and perhaps to an advantage. At any rate the plan should be carefully studied.

Twenty-Second Annual Meeting

Medical and Surgical Association of the Southwest

NOVEMBER 21, 22, 23, 1935

PROGRAM

THURSDAY MORNING, NOVEMBER 21, 1935

Registration—8:00 to 9:30 A. M. The Registration Desk, located on the Mezzanine Floor of Hotel Hussmann, will open at 8:00 a. m. Everyone attending the Conference is required to register. Registration Fee is $5.00. The official badge, which you receive when you register, admits you to all Conference activities, and should be worn conspicuously at all times.

FIRST GENERAL ASSEMBLY

Ball Room—9:30 a. m.

Dr. C. R. Swackhamer, First Vice-President, Presiding

Opening Address: Dr. C. R. Swackhamer.
"Peptic Ulcer".....Dr. Charles T. Stone, Galveston, Texas
"Conservative Surgical Treatment versus the Radical Operation for Peptic Ulcer" .....Dr. V. C. Hunt, Los Angeles, California
"Pediatrics".....Dr. Enos Paul Cook, San Jose, California

12:30 p. m.—Luncheon

Round Table Discussions

Medical.....Dr. Charles T. Stone, Galveston, Texas
"Complications of Acute Appendicitis....Dr. V. C. Hunt, Los Angeles, Cal.
"Treatment of Urinary Infections".....Dr. Herman C. Bumpus, Jr., Pasadena, California.
"Discussion of Allergic Toxemia".....Dr. Albert Rowe, Oakland, California
Eye, Ear, Nose and Throat.....Dr. Isaac H. Jones, Los Angeles, California

AFTERNOON GENERAL ASSEMBLY

Ball Room—2:00 p. m.

"Repair of the Pelvic Floor"....Dr. James C. Masson, Rochester, Minnesota
"Hemorrhoids and Their Treatment".....Dr. Louis A. Buie, Rochester, Minnesota.
"Urinary Lithiasis".....Dr. Herman C. Bumpus, Jr., Pasadena, California
"The Prescribing of Hearing Aids"—(Illustrated by stereopticon slides)—Dr. Isaac H. Jones, Los Angeles, California.

EVENING GENERAL ASSEMBLY

Ball Room—8:00 p. m.

"Allergy—Its Manifestations and Diagnosis"....Dr. Albert Rowe, Oakland, California.
"The Cardiovascular System in Relation to Surgery".....Dr. V. C. Hunt, Los Angeles, California.
"A Consideration of the Larger Aspects of the Problems of Heart Disease" Dr. Charles T. Stone, Galveston, Texas.

FRIDAY, NOVEMBER 22, 1935

CLINICS

8:00 a. m.

"Congestive Heart Failure".....Dr. Charles T. Stone, Galveston, Texas
"Pyelogram Clinic".....Dr. H. C. Bumpus, Jr., Pasadena, California
"Rectal Disease".....Dr. L. A. Buie, Rochester, Minnesota
"Eye, Ear, Nose and Throat"....Dr. Isaac H. Jones, Los Angeles, California

9 a. m.

"Congenital Malformation of the Vagina".....Dr. James C. Masson, Rochester, Minnesota.
"History Taking and the Allergic Patient".....Dr. Albert Rowe, Oakland, California.

MORNING GENERAL ASSEMBLY

Ball Room—10 a. m.

"Intestinal Obstruction".....Dr. V. C. Hunt, Los Angeles, California
"Gastro-Intestinal Allergy".....Dr. Albert Rowe, Oakland, California
"Aviation—A Medical Specialty." (Motion pictures "Why and How Cats Turn Over"). Dr. Isaac H. Jones, Los Angeles, California.

Luncheon—12:30 p. m.

Round Table Discussions

"Gynecology".....Dr. James C. Masson, Rochester, Minnesota
"Early Diagnosis of Cancer of the Rectum"....Dr. L. A. Buie, Rochester, Minnesota.
"Treatment of Malignancy of Urinary Tract".....Dr. H. C. Bumpus, Jr., Pasadena, California.
"Eye, Ear, Nose and Throat....Dr. Isaac H. Jones, Los Angeles, California.
Medical.....Dr. Charles T. Stone, Galveston, Texas
Pediatrics.....Dr. Enos Paul Cook, San Jose, California

AFTERNOON GENERAL ASSEMBLY

Ball Room—2:00 p. m.

"Modern Treatment of Pernicious Anemia".....Dr. Charles T. Stone, Galveston, Texas.
"Anal Infections".....Dr. L. A. Buie, Rochester, Minnesota
"What We Should Know About Endometriosis".....Dr. James C. Masson, Rochester, Minnesota.
"The Avoidance of Complications Associated with Prostatic Resection"—Dr. Herman C. Bumpus, Jr., Pasadena, California.
Pediatrics.....Dr. Enos Paul Cook, San Jose, California

Friday Evening—Annual Banquet

SATURDAY, NOVEMBER 23, 1935

CLINICS

8:00 a. m.

"Bronchial Asthma".....Dr. Albert Rowe, Oakland, California
"Eye, Ear, Nose and Throat"....Dr. Isaac H. Jones, Los Angeles, California
"Proctology".....Dr. L. A. Buie, Rochester, Minnesota
"Pediatrics".....Dr. Enos Paul Cook, San Jose, California

MORNING GENERAL ASSEMBLY

Ball Room—9:00 a. m.

Clinical Pathological Conference....Dr. Charles T. Stone, Galveston, Texas
"Diverticulosis and Diverticulitis of the Colon".....Dr. V. C. Hunt, Los Angeles, California.
"Ulcerative Colitis".....Dr. L. A. Buie, Rochester, Minnesota
"Treatment of Pollen and Other Inhalant Allergy".....Dr. Albert Rowe Oakland, California.

Luncheon—12:30 p. m.

Introduction of President-Elect.
Closing Address—Dr. James J. Gorman.

AFTERNOON GENERAL ASSEMBLY

Ball Room—2:00 p. m.

General Business Meeting of the Association.
Reports of Committees.
Election of Officers.
Selection of Meeting Place for 1936.

COMMERCIAL EXHIBITS

Meade-Johnson Company, Denver, Colorado
Retail Drug Association, El Paso, Texas
Border Serum Company, El Paso, Texas
Phillip Morris Company, Ltd., New York City
General Electric X-ray Corporation, Dallas, Texas
J. A. Majors Company, Dallas, Texas
McKesson, Kelly & Pollard, El Paso, Texas
Southwestern Surgical Supply Company, El Paso, Texas

SCIENTIFIC EXHIBITS

(1) A. H. Parmalee and Louis J. Holpern, Rush Medical School and Cook County Hospital: "Diagnosis of Congenital Syphilis."

(2) Carl H. Green, J. Russell Twiss and R. Franklin Carter, New York Post-Graduate Medical School: "Diagnosis of Gallbladder Disease."

(3) Moses Swick, Mount Sinai Hospital and Harlem Hospital, New York: "Congenital Anomalies of the Urinary Tract."

(4) E. Perry McCullagh, W. Kenneth Cuyler and D. Roy McCullagh, Cleveland Clinic Foundation, Cleveland: "Experimental and Clinical Studies of Hormone Assays."

(5) Samuel Ayres, Jr. and N. P. Anderson, Los Angeles, California: "Focal Infection in Dermatology."

(6) Louis Schwartz, United States Public Health Service, Washington, D. C.: "Industrial Dermatoses."

(7) Joseph Buchman, Hospital for Joint Diseases, New York: Healing of Osteomyelitis following Maggot Therapy."

(8) Jesse G. M. Bullowa Littaner Pneumonia Research Fund of New York University, Harlem Hospital Station, New York: "Management of the Pneumonias—Serum Treatment and Oxygen."

(9) American Society for the Control of Cancer: Cancer of the Uterus."

(10) P. Brooks Bland, Arthur First and Leopold Goldstein, Jefferson Medical College, Philadelphia: "Clinical Investigation of Functional Sterility."

(11) Charles A. Behney & Douglas P. Murphy, Department of Obstetrics and Gynecology, University of Pennsylvania School of Medicine, Philadelphia: "Carcinoma of the Cervix—Its Early Detection."

(12) Thomas D. Allen and G. W. Nethercut, Illinois Eye and Ear Infirmary, Chicago: "First Aid in Eye Injuries."

(13) John A. Kolmer, Research Institute of Cutaneous Medicine and Temple University, Philadelphia: "Immunity and Vaccination in Infantile Paralysis."

(14) Manfred Kremer & Maurice Asher, Newark, N. J.: "Management of Non-Specific Ulcerative Colitis."

(15) Louis I. Dublin, Metropolitan Life Insurance Co., New York: "The Trend of Cancer—Incidence, Mortality and Curability."

(16) Lewis M. Hurxthal and Frank N. Allan, Lahey Clinic, Boston: "Clinical Endocrinology."

(17) Karl John Karnaky, Department of Gynecology and Obstetrics, John Sealy Hospital, Texas University School of Medicine, Galveston and Jefferson Davis Hospital, Houston: "Cause and Treatment of Leukorrhea, with Special Reference to Trichomonas Vaginalis, Monilia Albicans and Cervical Lesions."

(18) L. E. Prickeman, Mayo Foundation for Medical Education and Research, Rochester, Minn.: "Differential Diagnosis of Asthma."

(19) David Sashin, Hospital for Joint Diseases, New York: "Relation of Pathologic Change in the Intervertebral Disks to Low Back Pain."

(20) J. P. Lord, R. D. Shrock and H. P. Johnson, Orthopedic Department, University of Nebraska, Medical College, Omaha: "Bone Tumors."

(21) Albert Sailand, W. E. Costolow and O. N. Meland, Los Angeles: "Selective Radiologic Treatment of Neoplastic Diseases."

(22) John Russell Carty, New York Hospital, New York: "Diagnostic Scope of Soft Tissue Radiography."

(23) Charles Mayer & S. Leon Irael, Mount Sanai Hospital, New York: "Clinical and Experimental Studies on Effects of Huge Doses of the Estrus Inducing Hormones."

(24) Dr. Leslie Smith, El Paso: "Endothermic Methods in the Treatment of Skin Cancer."

COMPLYING WITH THE NARCOTIC LAW

The Ohio State Medical Journal recently carried a statement to the effect that many physicians seemed not to understand the importance of observing to the letter the regulations of the Harrison Narcotic Law and therefore might innocently get into serious trouble. One of the shortcomings of the physician is in not filling out the narcotic prescription in conformity with the instructions. Another minor violation which it is claimed that many physicians are guilty of is to write a prescription for a patient for a tube of morphine or other narcotic and instead of giving it to the patient puts it into his medicine case—for legitimate use. This would not seem to be a serious matter but in the trial of a case where a clever lawyer represents the government, a physician might be placed in a most embarrassing situation. As a matter of fact not long since such a case in Cleveland hinged entirely upon the technical question of whether the physician had written a prescription for a narcotic for a patient and appropriated it for his own use. The attorney for the government claimed that this violated two phases of the law: The collection of revenue and the protection of morals. It is true the amount of revenue involved was only one cent but who knows what was the damage to morals.

It is better to endure the red tape than it is to have to sit in court and hear implications of wrong doing flung at you. The Harrison Act has a laudable purpose, however it may have been mismanaged and it is the duty of the physician to comply with the law—to the strict letter of the law.

GENERAL TUTHILL RETIRES AS GUARD COMMANDER.

Dr. Alexander M. Tuthill, Commander of the 45th Division of the National Guard of the United States comprised of troops in Colorado, Oklahoma, New Mexico and Arizona, retired September 22, having reached the age limit of 64. General Tuhill has had an active military career as well as an active life as a physician. He came west from the state of New York in 1877 with his parents who settled on the Pacific Coast. He received his medical degree in 1895. In 1898 he went to Morenci to become assistant physician to the Arizona Copper Mining Company, the latter a Phelps-Dodge Corporation. In 1903 he became Chief Surgeon of the Detroit Copper Mining Company, resigning in the fall of 1919 to enter private practice in Phoenix where he is at the present time.

His first military srevice was as an enlisted man in the California National Guard Cavalry in 1896, a year after he received his medical degree. He served for two years in this company, resigning when he decided to move to Arizona. In July of 1903 a cavalry troop was organized in Morenci and he was elected Captain, in which capacity he served until August, 1910, when he was commissioned Colonel of Infantry. He commanded the First Arizona Infantry, now the 158th Infantry, and on May 13, 1916, the regiment entered the Federal service on the border. In August of 1917, he was commissioned Brigadier General and assigned to command the 79th Brigade of the 40th Division. The brigade consisted of the 157th Colorado Infantry, 158th Arizona Infantry, and a machine battalion of the First New Mexico Infantry. He remained in command of the 79th until his return from France, being discharged April 11, 1919. He was recommissioned by the War Department December 28, 1928, and assigned to command the 89th Brigade, composed of the 157th and 158th, his former two regiments. In August, 1933, he was promoted from Brigadier General to Major General and assigned to command the 45th Division which has a peace-time strength of 8,000 men and which in war-time emergency may be increased to 25,000.

PHYSICIANS' EQUITY ASSOCIATION OF AMERICA INCORPORATED

This corporation is a New York Institution with elaborate offices at 745 Fifth Avenue. The aims of the organization are stated to be minimizing of free clinic service, assurance of reasonable compensation to the physicians, legal regulation of abuses of the practice of the healing art, removing from the profession all unqualified healers, the creation of a clearer economic situation between the patient and the doctor, etc. The corporation is at the present time giving benefits and in one way or another attempting to raise a considerable fund to further their objects.

THE SUB-STANDARD PRACTITIONERS MAKE AN EFFORT TO BECOME DOCTORS OF MEDICINE

From the presidential address of C. E. K. Vidal, M. D., are taken portions of two short paragraphs which are nicely phrased:

"Possessing many of the elements of drama was the effort of the osteopaths to pass, at the recent session of the legislature, a revolutionray bill. Its purpose was to confer on the members of their cult all the rights and privileges of the medical profession. With a well-organized political machine they succeeded in bringing it to the House with a favorable committee report. It was decisively defeated in committee of the whole. On our side we were caught napping. It was a surprise offensive—a clean break-tnrough. A counter-attack was hurriedly organized and successfully conducted. It was equally a pleasant surprise to see how an emergency could unite the profession and note how large a majority of the people of the state appreciated our position and rallied to our support. . . What lessons can be learned from the episode? The necessity of unity. A profession rocked by discord and upset by dissension is always vulnerable to attack. Why are only 73 per cent of the medical men of the state members of the Association? Why not 95 per cent? Our esteemed past president, in his address last summer, stated that we have always leaned over backwards to be fair and unprejudiced in dealing with the cults. He was wholly and unqualifiedly right. To one who sat at the committee hearings and heard the talk of a quarrel between two schools of medicine, the conviction arose that we had been too fair. The public should know that there is but one school of medicine, evolved through the centuries and based and builded on the unshakeable foundation of scientific truth. In rearing it, these cultists, these heretics, have mixed no concrete for its footings, have mortised no beams into its superstructure. Yet they wish to enter by the back door and use the completed building for their own."

SOCIALIZED MEDICINE IN EUROPE

Dr. Louis J. Garlepy of Detroit, Michigan, made a trip through England, Belgium, Switzerland, Germany, and France with the idea of investigating the system of Social Medicine now in use. He talked to patients and doctors in great numbers. A careful reading of his article[1] is well worth while. He says the patients generally are pleased with their treatment under the various systems. The doctors also as a general rule are well pleased.

His almost universal finding that the patients pass through tha doctor's office at the average rate of about one per minute shows conclusively that something is wrong. The doctors are not giving adequate time to any one case to give it careful examination.

Under the system practised in France, Germany and England the medical standards are much inferior to those of the United States. The doctor finally concludes that the Pino plan as used in Detroit, similar to the San Diego plan, offers the best plan for America.

1. Mich. State Med. Jour. 34: 546. Sept. 1935.

A DEFINITE MEDICAL ECONOMICS PROGRAM FOR EVERY MEDICAL ORGANIZATION

In next issue we publish an outline of a definite medical economics program which is planned and being followed by the Medical Society of the District of Columbia. The El Paso County Medical Society of our constituency also has a broad comprehensive program. We hope to have full details in the near future of this program. It would seem that the exigency of the medical economics question should make every County and State Medical Association have a live wire working medical economics committee and every member on his toes assisting to work out a program for giving medical care of the best type not only to the low income groups but to the indigent as well. Included in the program it seems to us should be a plan for telling the public the truth about the substandard—the back door—practitioners of the healing art.

THE ATTORNEY GENERAL'S OPINION REGARDING BASIC SCIENCE LAW AND NATUROPATHS

"It is the opinion of this office that the Naturopath physicians must take the examination as provided for in the Basic Science Law. This opinion is based upon the fact that the Basic Science Law was a referred measure and can not be changed by a legislative act."

AN ERROR IN DR. SCHOFIELD'S DISCUSSION OF DR. FLINN'S PAPER

What he said in place of that which was printed from the reporter's copy in Southwestern Medicine last month on page 305 is as follows:

"I have been interested in endeavoring to raise the calcium content of the blood by use of vitamin D. At Boulder Dam we have used gallons of irradiated oils in the treatment of healing fractures. The level of the blood calcium content may have been raised, but we have not found healing and calcification to have been made more effective by this medication."

PUBLIC HEALTH NOTES

J. ROSSLYN EARP, Dr. P. H.
Director New Mexico State Bureau of Public Health.

New Books

The summer publishing season has been generous to public health. First in importance of the new books must be reckoned the text book on **Public Health Administration** from Harvard[1]. This is in no sense a rival to Rosenau's text in preventive medicine. The latter deals with methods of preventing disease whereas Doctor Smillie's new work deals exclusively with the organization of the forces of prevention. Beginning with the basic public health functions of government the author proceeds to show what part each division of our American governmental system—federal, state and local—may properly play in a unified coordinated system of health promotion and protection. We find ourselves heartily in agreement with the recommendation of Professor Smillie that the trend should be towards more adequate and self-sufficient local health departments. The word chosen to describe the function of the state health department is leadership and it is the right word. Since the book was written before the passage of the Social Security Act the more intimate relationship between federal and state health departments pressaged therein is not mentioned. This is perhaps fortunate for no safe evaluation of the results of that act is possible at this time. It has still to be shown that the national congress may be relied upon to make regular appropriations in support of the new plans. And the emphasis here is upon the word regular. Spasmodic generosity from Washington may be more disorganizing than no subsidy at all.

It is to be hoped that many general practitioners will read Doctor Smillie's book for its intrinsic interest as well as to help them in understanding what their colleagues in the special field of public health are trying to do. Certainly no public health official can afford not to own a copy. Health officers will find a valuable supplement in a volume of **Record Forms** just published by the Commonwealth Fund[2]. It has been prepared by two members of their staff who have had the advantage of cooperation with the committee on administrative practice of the American Public Health Association. The book is published at less than cost and is a rare bargain.

From the School of Hygiene of the University of London comes a scholarly **Study in Epidemiology**[3]. The president of the Royal Statistical Society spares his readers from all difficult mathematical abstractions and yet succeeds very well in conserving the mathematical romance of a **quantative** study of the phenomena of disease. And there are practical lessons for our profession; for example the demonstration on page 209 that it may be futile or worse to immunize school children against diphtheria if their younger brothers and sisters in the home are left unprotected.

Any of these books may be borrowed by readers of Southwestern Medicine from the library of the New Mexico Bureau of Public Health.

1. Smillie, Wilson G. Public Health Administration in the United States. New York: The Macmillan Company, 1935, pp. 458. Price $3.50.

2. Walker, W. F. and Randolph, C. R. Recording of Local Health Work. New York: The Commonwealth Fund. 1935. pp. 275. Price $2.50.

3. Greenwood, M. Epidemics and Crowd-Diseases. London and New York: The Macmillan Company. 1935. pp. 409. Price $5.50.

EL PASO COUNTY MEDICAL SOCIETY

Meeting was called to order by Dr. B. F. Stevens 7:30 P.M. Sept. 9, 1935, Hotel Dieu Nurses Home. Twenty-two members were present. Minutes of the previous meeting were read and approved.

Dr. Frank Goodwin read paper entitled "Intracapsular fractures of hip" and presented two patients, who had been successfully treated. Discussed by Drs. George Turner and B. F. Stevens.

Applications for membership of Dr. George Arnold Stevens and Dr. W. Adams were read. Dr. Stevens was accepted through transfer. Dr. Adams was referred to the Board of Censors.

Dr. Rennick read the names and amounts received by the doctors from the F. E. R. A. work done during May, June and July according to previous resolution. Dr. Gallagher moved to dispense with the reading of the above list. This was passed.

An informal report was given by Drs. Homan, Rennick and Egbert on the present status of the Central Medical Bureau, with discussion by most of the members present.

Meeting adjourned. L. O. DUTTON, Sec.

NEWS ITEMS

Dr. J. M. Sartin resigned from the Arizona State Hospital to take post graduate work at Tulane. Dr. Sartin was associated with the State Hospital for 15 months and formerly was House Physician at the Good Samaritan Hospital.

Dr. C. B. Warrenburg has recently located in Phoenix in the Grunow Memorial Clinic Building. His work is limited to obstetrics.

Dr. F. L. Reese of Phoenix, Arizona, addressed the Phoenix Lions Club September 26 most learnedly upon the Constitution of the United States.

Dr. David M. Davis of Phoenix, President of the Medical and Surgical Assn. of the Southwest, has been called to Philadelphia as professor of genito-urinary surgery in the Jefferson Medical College. Before coming to Phoenix five years ago Dr. Davis had been a member of the faculty of the Johns Hopkins School for fourteen years and for a short time professor of urological surgery at the University of Rochester, Rochester, New York. Dr. Davis is a graduate of Princeton, 1907, and Johns Hopkins Medical School, 1911. While in Phoenix he has been active in the various medical organizations, the Phoenix Chamber of Commerce and in the Kiwanis Club.

Dr. George A. Hays, formerly with the Missouri State Board of Health, is now connected with the Arizona State Board of Health as the epidemiologist replacing Dr. Hugh S. Stanton who resigned. Dr. Hays served for five years as health officer at Texarkana and was also health officer at Pine Bluff, Arkansas. He is a graduate of the University of Arkansas and of Columbia University.

Dr. Hugh F. Stanton, former epidemiologist of Arizona, has taken the post of resident physician of the Wickenburg General Hospital, where he is engaged in private practice.

Dr. A. Carl Armbruster and wife, son of Dr. and Mrs. A. C. Armbruster of Phoenix, have been spending the summer in Phoenix and at the last report he has not decided as to where he will locate but probably in the San Francisco Bay district.

Dr. Lawrence von Pohle addressed the Rotary Club of Chandler at a recent meeting, describing his visits to the Eastern Clinics and hospitals this summer. He has been elected president of the Chandler Chamber of Commerce.

Dr. and Mrs. Will Wilkinson of Phoenix, Arizona, vacationed in San Diego.

Dr. and Mrs. Thomas W. Woodman of Phoenix spent September on the Coast.

Dr. S. D. Little of Phoenix vacationed in Tacoma, Washington, during September.

Dr. W. B. Watts of Miami, Arizona spent a few days in Phoenix during the early part of September.

Merial Watkins, daughter of Dr. and Mrs. Warner W. Watkins, was married August 11 to Kenneth E. Grimm of Phoenix in the First Baptist Church before a large group of admiring friends. Mr. and Mrs. Grimm have gone to Tucson where Mr. Grimm will continue his studies at the University of Arizona.

Dr. A. N. Crain, Director of the Maricopa County Public Health Unit of Arizona, and family are spending a short vacation in Santa Ana, California during September.

Dr. Nelson D. Brayton, Secretary of the Gila County Medical Society, Globe, Arizona, will hold its first meeting of the year Tuesday, October first, with President-elect Jess D. Hamer as guest speaker.

Dr. Joseph M. Greer of Phoenix is to head the Program committee for the dedication of the Phoenix Sky Harbor, a recently acquired airport, on Armistice Day, November 11.

Dr. and Mrs. John E. Bacon of Miami, Arizona spent a few days in Phoenix during September where they had come to send their son on his way to Stanford where he is a student.

Dr. and Mrs. M. I. Leff of Glendale, Arizona spent their vacation at the Coast. Doctor Leff made a tour to British Columbia and back.

Dr. and Mrs. M. Matanovich of Phoenix vacationed in California during September.

Dr. and Mrs. C. R. K. Swetnam of Phoenix announced the marriage of their daughter, Margaret Keith Swetnam to Russell Raymond Raney of Auburn, New York.

Dr. W. Chapman of Los Mochis, Mexico, spent several days in Nogales recently visiting friends.

Dr. and Mrs. J. H. Woodard, of Ruby, are vacationing in California.

Dr. E. C. Houle, of Nogales, has recently returned from California, where he spent a 10 day vacation.

Dr. Charles S. Smith of Nogales, after an enforced absence from his office due to ill health, has re-opened his offices. Dr. Smith's practice is limited to eye, ear, nose and throat.

Dr. Zenas Noon of Nogales was recently appointed Acting Surgeon, United States Public Health Service, and is in charge of the office in Nogales.

Dr. Chaney is now in charge of the medical work at CCC F-63-A camp, located near Nogales.

Dr. A. L. Gustetter of Nogales spent several days in California recently. Returning home he was accompanied by Mrs. Gustetter, who has been vacationing at Long Beach.

Miss Lydia Potthoff, school nurse, of Santa Cruz County, has returned from a vacation spent at St. Paul, Minn.

Dr. George Truman of Phoenix addressed the Physicians of the Indian Service meeting at the Phoenix Indian School October 12 on Public Health.

Dr. Orville Harry Brown addressed the Arizona Branch of the United States Indian Service Medical Society at the Phoenix Indian School Saturday afternoon October 12 on the subject of Treatment of Pneumonia with Intravenous Injections of Quinine.

Dr. A. J. McIntyre of Phoenix was called to San Diego recently to confer with the committee on arrangements for the President's annual birthday ball in Arizona where further plans will be promulgated for control of Infantile Paralysis.

Dr. E. A. Metzger is removing from Clayton, New Mexico, to Raton, in the same state where he is to be associated with Dr. M. F. Smith.

Dr. Z. A. d'Amours is moving into the office which will be vacated by Dr. Metzger in Clayton, N. M.

Dr. Lewis Baldwin of the Desert Sanatorium in Tucson, Arizona, was in Phoenix during September on social business, at which time many of his Phoenix conferes had an opportunity to greet him.

PROCEEDINGS OF THE NEW MEXICO MEDICAL SOCIETY

53rd Annual Meeting Albuquerque, N.M., May 23-25, 1935.

(All business and scientific sessions were held in the Indian Room of the Franciscan Hotel.)

(Continued from September issue)

ALTERNATE DELEGATE TO AMERICAN MEDICAL ASSOCIATION:

Nomination of Dr. W. R. Lovelace (Albuquerque) was offered by Dr. Carl Mulky (Albuquerque), seconded by Dr. C. A. Miller (Las Cruces). Elected.

BOARD OF MANAGERS, SOUTHWESTERN MEDICINE:

Nomination of Dr. C. H. Gellenthien (Valmora) was made by Dr. W. R. Lovelace (Albuquerque).

Nomination of Dr. J. R. Earp (Santa Fe) was offered by Dr. Carl Mulky (Albuquerque). Both were elected.

MEETING PLACE 1936:

Dr. R. O. Brown (Santa Fe) stated: "Santa Fe will be delighted to have the meeting held there next year. We think we have a nice place to hold meetings. It has been three years since you have been to Santa Fe and we will try to give you a good time and have a good meeting."

Dr. H. A. Miller (Clovis): "We would like to invite you to Clovis. We have had excellent rains lately and expect to have the biggest corn crop this year we have ever had. We extend to you a cordial invitation to meet at Clovis next year."

Dr. R. L. Bradley (Roswell): "I know that Dr. Culpepper wants us to come to Carlsbad next year and that he especially asked Dr. Miller to nominate Carlsbad. Here he comes now, however, and he can speak for himself."

Dr. M. B. Culpepper (Carlsbad): "I understand a partial agreement was entered into last year at the meeting at Las Vegas whereby Las Cruces was to have the first claim on the 1936 meeting. If Dr. Gerber has any claim on the meeting for next year, I would certainly not make a request for it or proffer an invitation from Carlsbad, and therefore wish first to hear what the Las Cruces men have to say in regard to the matter."

Dr. C. A. Miller (Las Cruces): "While we would be delighted to entertain you at Las Cruces, as we are in the south end of the State and very much isolated, we could probably not get more than 50 members to attend, if that many, and we believe the meetings should be held at some more central point where there would be a larger attendance."

Dr. M. B. Culpepper (Carlsbad): "Such being the case, I want to assure you that Carlsbad wants the meeting held there next year. The different interests at Carlsbad, including the Doctors, have wired me to offer this invitation and I am filing with the Secretary, Dr. Cohenour, a list of telegrams including one each from the Mayor, the Carlsbad Commercial Club, the Rotary Club, the City Council, the Lions' Club and the Hotels, asking me to extend this invitation.

Motion by Dr. R. L. Butler (Clovis) that the So-

ciety hold its annual meeting in 1936 at Carlsbad, N. M., was seconded by Dr. W. R. Lovelace (Albuquerque) and carried.

Dr. M. B. Culpepper (Carlsbad): "I thank you very much for your indulgence. We like to entertain and we are doing lots of entertaining these days, as quite a number of different organizations have met recently in Carlsbad. We are becoming quite a convention city. Probably most of you have already visited the Cavern, but we have other very interesting places to see also, with plenty of good hotel facilities, entertainment qualifications and one of the best bathing beaches in the State. I am sure you will all have a good time and a good meeting. I wish to express my gratification for the honor of being selected as your next President, and while I feel you have made an error in the selection, yet with good health and with the cooperation of those who manage the affairs of the Society, I will do the best I can.

OTHER BUSINESS

The Secretary's report was submitted and read by the Secretary, Dr. L. B. Cohenour. No objection arising the report was approved and accepted as read.

LEGISLATIVE COMMITTEE: Dr. R. O. Brown (Santa Fe) stated that he had no written report for the Legislative Committee, but that in accordance with instructions he engaged Mr. Carl Gilbert to follow the trend of events in the Legislature. Mr. Gilbert found that a Bill had been introduced to license naturopaths in the State, whereupon he secured a hearing before the committee to which the bill was committed in the House, at which practically all the members of the Santa Fe Society were present. The hearing lasted for an hour and a half or two hours. Following that the bill was reported unfavorably to the House. It was called out of committee, however, in the last days of the session and passed by the House, but died in committee in the Senate. Apparently in the House the bill was passed under some sort of agreement, though trades are unethical, and when it reached the Senate the naturopaths did not try to force it. The attitude we took during the committee hearing was passage of the naturopath bill provided we could include in it a basic science law for all physicians. While the bill was passed in the House without such amendment, the amendment would have been added in the Senate and probably when the naturopaths found this out they allowed the bill to drop. There was some talk later about the medical profession and the cults getting together and passing either a basic science law or a naturopath bill, but nothing came of it and the matter was dropped. If things are bright next year, we may be able to get a basic science law through if the members of the House of Delegates concur in our opinion and we think it would be a good idea to retain Mr. Gilbert as legislative advisor or agent. It is much easier to take care of these matters when someone who knows the ropes is on the job. Mr. Gilbert's bill, $75.00, was very moderate. If a special session is called, we may be able to get somewhere with a basic science bill.

Dr. R. L. Bradley (Roswell): "I do not believe we should compromise with the cults, but should just try to put our own Bill through. If we cannot get a basic science act through without compromising with a cult, we do not want it. The thing for us to do is to get busy and get our own Bill through."

Dr. R. O. Brown (Santa Fe): "I did not mean to leave the idea with you that we were compromising in any way. We did not agree to the passing of the Naturopath Bill first and then to introduce another Bill afterward. An amendment was to be added to the Naturopath Bill and the people who were licensed under it would all have to pass a basic science examination, which they would not be able to do."

Motion by Dr. H. A. Ingalls (Roswell), seconded by Dr. C. A. Miller (Las Cruces), that the Legislative Committee be continued and that Dr. Brown be instructed to again employ Attorney Gilbert, was carried.

Dr. R. O. Brown (Santa Fe): "Mr. Gilbert wanted me to mention that when things come up in which the Doctors are interested, if they will send him telegrams, it will help matters."

REGISTRATION FEE FOR PHYSICIANS:

Dr. R. O. Brown (Santa Fe): "I want to say a word in regard to the matter of a registration fee for physicians in the State as a means for raising funds in the prosecution of offenders against a registration law. At present the Board of Medical Examiners have no funds available to pay for clerical expense in keeping records, etc. The Secretary of the Board suggested, as have others before him, that one method to raise funds would be to get a law enacted requiring a license fee from all physicians in the State, say something like from two to four dollars a year for the first two or three years until a fund is raised and then reduced to $1 per year. If the Medical Society backs such a measure, the Legislature will undoubtedly put it through. It seems like a special tax on the Doctors, but on the other hand it will serve our purpose to some extent in fighting the illegal practitioners."

Dr. R. L. Bradley (Roswell) suggested that the dues be raised one or two dollars in order to collect a fund.

Dr. Carl Mulky (Albuquerque) asked how much money there was in the treasury and if a sum could not be donated from it for the purpose.

Dr. L. B. Cohenour (Albuquerque) replied that at present there is about $754 in the treasury.

Dr. C. A. Miller (Las Cruces) remarked that the great trouble with arrangements of that kind is that there will be other men, who are not members of the Society, and who will not be paying anything, and yet receive as much benefit as those who do, whereas if there was a State law compelling registration, every one would have to pay alike.

Dr. R. L. Bradley (Roswell) stated that it was up to the District Attorneys to prosecute illegal practitioners but they were not willing to do so as the laws are not very strong and should be strengthened.

Dr. R. O. Brown (Santa Fe) remarked that Mr. Gilbert did recommend that some sort of Bill be introduced in the interest of medicine and surgery, giving adequate definition of medicine and surgery, as under the present laws there is no means of controlling naturopaths, chiropractors and the like, as the definition is inadequate.

Dr. W. R. Lovelace (Albuquerque) asked Dr. G. T. Vinyard, of Amarillo, Texas, in regard to methods used in Texas.

Dr. G. T. Vinyard (Amarillo, Texas): "Up until about three years ago, the expenses of the Medical Examiners in Texas were taken care of by donations from a few members of the Association, but there were never enough funds available to carry along this work as it should have been. Then we managed to get before the Legislature a bill requiring all physicians to register, carrying a registration fee of two dollars, and if registration is not accomplished by a certain time, the physician is violating the law if he continues to practice, and can be prosecuted. Now we have sufficient money to pay the expenses of the Board of Examiners and run the "chiros" pretty hard. There should, however, be a clause in your bill to the effect that doctors who live outside the State and who are registered to practice within the State, shall pay a higher registration fee than that required of physicians liv-

ing within the State, as it would not be fair if I, living in Texas, and not paying dues in New Mexico, should come over in New Mexico and treat cases, and get the same protection as Dr. Lovelace, who is paying his dues.

Motion by Dr. W. R. Lovelace (Albuquerque) that the Legislative Committee be instructed to have a bill drafted, to be passed at the next session, incorporating a two dollar license fee for every person practicing medicine in the State, it was seconded by Dr. C. A. Miller (Las Cruces).

Dr. J. W. Stofer (Gallup) stated that most of the states have such a law. Some require one dollar license fee, others two dollars, with 10 dollar registration fees for doctors living outside the State who are licensed to practice in the State. It would be a good thing and would create a fund for the Board of Examiners to work with.

Dr. C. W. Gerber (Las Cruces): A voluntary contribution will not get us anywhere. Practically every state has seen the same necessity that we are seeing here today. Other boards of examiners have been in the same condition that ours has been. All the examiners can do is to examine papers. The law charges them with the regulation of legal practice of medicine within the State, but they have no funds for investigations. We have hosts of professional abortionists in the State and also many hopheads who should be prosecuted. I know them and you know them, but we have no evidence for the Court, and evidence can only be secured by an investigator, for which it takes funds. So I think if we can raise funds by some means, and this annual registration fee seems to be the best way in which it can be done, the board of examiners will be able to investigate and prosecute these illegal practitioners."

Dr. G. T. Colvard (Deming) remarked that it was the duty of the board of medical examiners to see that the registered physicians are protected from illegal practitioners.

Dr. W. R. Lovelace (Albuquerque) stated that he was on the board of medical examiners for about 18 years and during that time many complaints came before the board, but in answering letters about them, it could only be stated that it was regretted funds were not available for the prosecution of such practitioners. "It is high time," Dr. Lovelace said, "this Society is taking definite action to protect us. It is our own fault that there are so many "chiros" and other quacks, as we have not taken the interest we should have to protect ourselves, and indeed cannot take any action unless we have the money."

Dr. G. T. Colvard (Deming) signified his approval of the motion pending but suggested that it be amended to state"recommending passage" instead of "to be passed."

Dr. L. B. Cohenour (Albuquerque) suggested that a clause be inserted setting registration fee for non-resident physicians at 10 dollars.

Dr. R. L. Butler (Clovis) asked if an amendmnet would be accepted providing that the bill to be drawn by the legislative committee must be approved by the council before being submitted to the Legislature.

Dr. W. R. Lovelace (Albuquerque) stated that such amendments met with his approval, and motion was thereupon passed as follows: "The Legislative Committee be instructed to have a bill drafted, to be approved by the council, and recommended for passage at the next session of the Legislature, incorporating therein a two dollar annual registration fee for every practitioner of medicine in the State. For non-residents, fee should be 10 dollars."

Dr. R. O. Brown (Santa Fe): "We heard what Mrs. Sanger had to say in regard to the matter of *birth control*, and as many organizations have al-

The TULANE UNIVERSITY of LOUISIANA

GRADUATE SCHOOL OF MEDICINE

Postgraduate instruction offered in all branches of medicine.

SPECIAL COURSES:

Otolaryngology and Ophthalmology
March 2 to March 14, 1936.

Surgery, Gynecology and Obstetrics
May 11 to June 6, 1936.

Tropical Medicine and Parasitology
June 15 to July 11, 1936.

COURSES leading to a higher degree are also given.

A bulletin furnishing detailed information may be obtained upon application to the

Dean
Graduate School of Medicine
1430 Tulane Avenue **New Orleans, La.**

Behind

MERCUROCHROME

(dibrom-oxymercuri-fluorescein-sodium)

H.W.&D. *is a background of*

Precise manufacturing methods insuring uniformity

Controlled laboratory investigation

Chemical and biological control of each lot produced

Extensive clinical application

Thirteen years' acceptance by the Council of Pharmacy and Chemistry of the American Medical Association

A booklet summarizing the important reports on Mercurochrome and describing its various uses will be sent to physicians on request.

Hynson, Westcott & Dunning, Inc.
BALTIMORE, MARYLAND

ready adopted resolutions of a similar nature, it seems to me we might do likewise, and, therefore, I move the adoption of the following resolution:

"WHEREAS, The medical profession and the public have the right to look to the American Medical Association to assume a role of leadership in both the scientific and legal phases of all branches of medical practice; and

WHEREAS, The whole subject of birth control is seriously in need of scientific study and investigation; be it

RESOLVED, That The New Mexico State Medical Society request the House of Delegates of the American Medical Association to initiate a comprehensive program with respect to the study of birth control, instructing its appropriate agencies to undertake the necessary scientific study; and be it

FURTHER RESOLVED, That our Delegate to the House of Delegates be instructed to urge and vote for the adoption of such a program of investigation; and that the Secretary be hereby instructed to forward a copy of these resolutions to the Secretary of the American Medical Association."

Motion by Dr. Carl Mulky (Albuquerque), that such Resolution be adopted, was seconded by Dr. H. A. Ingalls (Roswell) and carried.

(Concluded in November issue)

THE NEUROLOGICAL HOSPITAL

The three-fourths million dollars former Christian Church Hospital and Veterans Hospital building 27th and The Paseo, Kansas City, Missouri, has been purchased by The Robinson Clinic, an eleemosynary corporation to be operated as a hospital for the care and treatment of nervous and mental illnesses.

The Robinson Clinic, with Dr. G. Wilse Robinson as Medical Director, and Dr. G. Wilse Robinson, Jr., as Superintendent, is the continuation of the oldest privately-owned hospital organization in Kansas City, having been established more than forty years ago by Dr. John Punton at 3001 Paseo. Since 1923, the clinic has been located in the historic Dyer mansion at 8100 Independence Road.

The new hospital of the clinic will be known as the Neurological Hospital, since cases received for treatment will be limited exclusively to nervous and mental disorders and their allied conditions, alcoholism and drug addiction. The building will be ready for occupancy about Oct. 10.

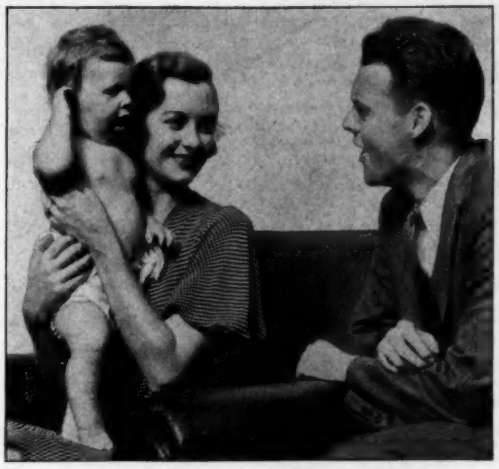
PALATABILITY

When you taste Petrolagar note its delightful flavor. This unusual palatability assures patient cooperation. Petrolagar is a mechanical emulsion of liquid petrolatum (65% by volume) and agar-agar.

Petrolagar

FOR CONSTIPATION

NOW PREPARED IN 5 TYPES



Maybe they are *your* patients

THEY'RE a healthy, happy young couple—proud in the possession of their first baby.

Though they are average people in average circumstances, they are as sure as anyone reasonably can be that their little one will develop normally — grow tall, straight and strong — have firm, sound teeth and bones.

For there was no deficiency in the mother's diet during pregnancy or lactation. There will be no deficiency in the *child's* diet as she grows older. Their doctor advised them, and faithfully they followed his advice. Now — because their child is well-formed, well-developed, sturdy — they have the utmost faith and confidence in their doctor and *will continue to follow his suggestions.*

Why doctors recommend Cocomalt

Cocomalt is an honest product, honestly advertised—accepted by the Committee on Foods of the American Medical Ass'n. Prepared according to directions, it adds 70% more food energy value to milk—increasing the protein content 50%, carbohydrate content 170%, calcium content 35%, phosphorus content 70%.

Cocomalt is rich in Vitamin D, containing not less than 30 Steenbock (81 U.S.P. revised) units per ounce. It is delicious; children and adults enjoy it. It is high in food-value — low in price. Recommended in all cases requiring *extra nourishment without digestive strain.*

Cocomalt comes in powder form, easy to mix with milk — HOT or COLD. Sold at grocery and drug stores in ½-lb. and 1-lb. air-tight cans. Also in 5-lb. cans for professional or hospital use, at a special price.

Cocomalt is accepted by the Committee on Foods of the American Medical Association.

Prepared by an exclusive process, under scientific control, Cocomalt is composed of sucrose, skim milk, selected cocoa, barley malt extract, flavoring and added Vitamin D. (From irradiated ergosterol.)

FREE TO DOCTORS: We will be glad to send a trial-size can of Cocomalt free to any physician requesting it. Just mail this coupon with your name and address.

R. B. Davis Co.
Dept. 82210 Hoboken, N. J.
Please send me a trial-size can of Cocomalt without charge.
Dr.
Address
City State

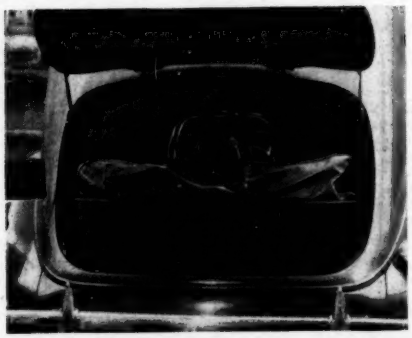
Now..

. A PORTABLE X-RAY UNIT THAT PROVIDES COMPLETE ANGULATION FOR RADIOGRAPHIC & FLUOROSCOPIC WORK

FACILITY in every day use is a most vital factor in Portable equipment. That is why all requirements for complete angulation, positioning, carrying, and safety have been stressed in the design of the Keleket Shock-proof Portable.

Such facilities as stereoscopic shifting mechanism, and other features usually found only on the most elaborate diagnostic equipment, are included in its design. Entirely exclusive to Keleket is the compact elevating device which provides flawless up and down movement. Collapsible tube stand folds quickly and easily for carrying.

The Keleket Shock-proof Portable stands supreme as a brilliant example of traditional Keleket ruggedness, simplicity, and capacity. Write for complete catalog and demonstration.



Packed in its two zipper-type, featherweight cases, the entire Keleket Portable takes up no more room than your golfing equipment.

KELEKET

THE KELLEY-KOETT MFG. CO.
213 W. Fourth Street,
Covington, Kentucky

•Where you can see the New Keleket Portable

SOUTHWEST SURGICAL SUPPLY CO.

311 Mills Street
EL PASO, TEXAS

121 North First Street
PHOENIX, ARIZONA